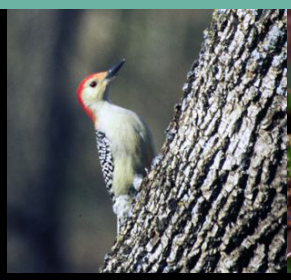
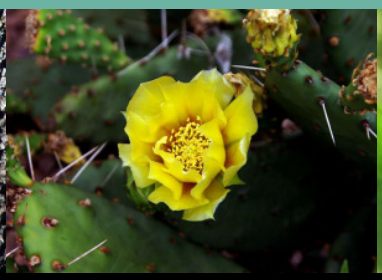
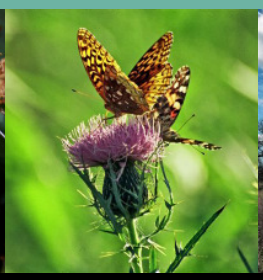
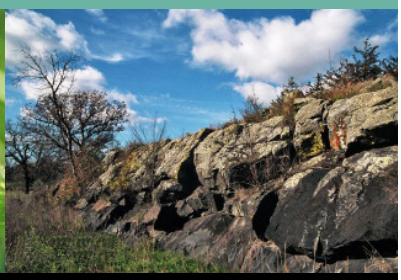
Conservation in the Middle Minnesota Valley:

A Blueprint and Action Plan

Conservation in the Middle Minnesota Valley: A Blueprint and Action Plan

Prepared for Green Corridor, Inc. and Southwest Initiative Foundation
by Great River Greening

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Front Cover Photographs: MN River Valley Overview - ©Brad Cobb; Red-bellied woodpecker, Prickly pear cactus in bloom, Butterfly, Rock out-cropping - ©Ron Bouoldan.

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Loran is a 30 year veteran of community, conservation and economic development leadership in the Mid Minnesota River Watershed. He has been an early paradigm pioneer of developing multiple recreational opportunities over a shared landscape (public habitat corridors/blocks) as a balanced recreation/conservation management paradigm, that would result in significant, renewable, corridor economic advantages within the Mid Minnesota River Valley. He has been instrumental in the development of various organizations and fundraising efforts with in the corridor. Loran has owned the Kaardal Insurance Agency in Redwood Falls since 1977.

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Brad has over 20 years of experience in natural resource acquisitions, program implementation, fundraising, public relations, grant writing, and development.
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Table of Contents

Abbreviations Used in This Document

AMA	Aquatic Management Area
BWSR	Board of Water and Soil Resources
C	Carbon
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
DNR	Department of Natural Resources
EQIP	Environmental Quality Incentive Program
GIS	Geographic Information Systems
MCBS	Minnesota County Biological Survey
MPCA	Minnesota Pollution Control Agency
N	Nitrogen
NRCS	Natural Resources Conservation Service
P	Phosphorus
RIM	Reinvest in Minnesota
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SNA	Scientific Natural Area
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Loads
USFWS	United States Fish and Wildlife Service
WHIP	Wildlife Habitat Incentives Program
WMA	Wildlife Management Area
WRP	Wetlands Reserve Program

Preface

Why another study of the Minnesota River Valley?

This comprehensive conservation plan was initiated in 2008, the sesquicentennial year of the initial fragmentation of the northern half of the Minnesota Dakota Reservation, which straddled the Minnesota River for 10 miles on both sides from Big Stone Lake to the mouth of Little Rock Creek, just east of Fort Ridgely. In 1858, this northern portion of the reservation was ceded by the Dakota to the U.S. government through two treaties signed in Washington, D.C.; shortly thereafter, the land was opened for homesteading. Following the US – Dakota Conflict of 1862, the southern half was forfeited by Congressional Act and also opened to homesteading. For a brief moment, reflect upon how this landscape with its unique ecological, cultural and historical resources would be different today, if this land sale and subsequent forfeiture had not occurred 150 years ago. This landscape was once whole and belonged to all of the Dakota people. It is now splintered into fragmented, privately-owned land tracts.

The Minnesota River Valley is a unique and special place with natural, cultural and historical resources that need to be protected, preserved and restored for future generations to study, to explore and to enjoy, while living or recreating within this landscape. This comprehensive plan focuses on all three resources.

Understanding the Demographic Opportunity across the Landscape:

The caretakers of this landscape since the homesteading days of the 1860s have been the grass-fed cattle ranching families, who utilized the unique areas that were too rocky or difficult to farm as grazing land for their cow/calf herds. The landscape was fragmented into rather large blocks – most in excess of 160 acres and some in excess of 600 acres – that served as the foundation for these ranchers. Many of these original ranches have remained within the same families for over a century, but a dramatic paradigm shift has occurred in the last 30 years: when the parents retired, the younger generation had already chosen career paths other than ranching. The majority of these ranches are now rented to others. The average age of the river bottom landowners within many of the Minnesota River Valley townships in Redwood and Renville Counties is now over 75 years old.

With this changing of the guard, there is a window of opportunity over the next 25 years – one that has not been afforded us since that initial opportunity 150 years ago – to usher in a new vision for the Mid Minnesota River Valley. The unique opportunity to make significant strides in re-connecting this fragmented landscape is here now, at the same time that the citizens of Minnesota have chosen to constitutionally dedicate funding for a period of 25 years to preserve, protect and restore these types of natural resources. Although it is hard to look into a crystal ball and exactly predict the future, the core elements are in place to make lasting change. As willing landowners step forward, if the monies are available to acquire these connecting properties as part of Minnesota's public conservation lands legacy, the vision of reconnecting these fragmented blocks into a significant "Green Corridor" has the potential of becoming a reality. This Green Corridor along the Minnesota River would become one of the most significant and visible success stories of Conservation Legacy Funding.

Green Corridor, Inc:

The Green Corridor, Inc. was formed by a coalition of engaged citizens, community and business leaders within the mid section of the Minnesota River Valley, who recognized the need to protect, restore and enhance the natural, historical and cultural resources of the Minnesota River Valley and to develop outdoor recreational opportunities that would promote regional economic growth, development and tourism in this area.

Redwood and Renville Counties are two of the 34 "Minnesota Frontier Counties" that were identified, following the 2000 census. This is not a compliment! A frontier county in 1860 was the land of opportunity and the 2010 definition is that a Frontier County is a location where there are few job opportunities and where young families choose not to live and companies choose not to locate, because there is no available work force. The only viable economic strategy to remove Redwood and Renville Counties from this list is to create a recreation industry, a recreation economy, that is a competitive regional recreational destination for outdoor activities like canoeing, hiking, biking, trail riding, hunting, fishing, bird watching and many others; and, for ecological, cultural and historical education and exploration activities, that will create innovative entrepreneurial opportunities (jobs) to service this new economy. The Green Corridor board is economically driven to preserve, protect and restore our natural, cultural and historical resources to serve as the foundational infrastructure to support this outdoor recreation industry.

With a vision for "creating a landscape of habitat connectivity, public access and economic viability in the Mid Minnesota River Watershed", the Green Corridor board and its partners will use this comprehensive conservation plan to make that vision a reality on the ground. Within those partnerships, we must implement the full complement of conservation tools to protect, preserve, restore and provide appropriate public access to these ecological, cultural and historical resources. Certainly, acquisition will be a key strategy, but the partners must utilize the other tools, such as easements, buffer strips, and private landowner restoration, education and outreach as part of their long term strategical initiatives.

The Green Corridor board recognizes that we are at the beginning of an on-going project that will involve multiple partners and stakeholder groups with ever changing organizational leadership over the ensuing years. The challenge will not only be in nurturing those partnerships on our journey, but also preparing the future leadership of the Green Corridor and the partnering organizations to grab the baton for this shared landscape legacy vision and carry it forward until the window of opportunity closes. This comprehensive conservation plan is the baton that will be passed on to the next generation and serve as the connecting foundation, as new conservation leaders step up in the future and carry this landscape legacy forward on behalf of the partnering organizations.

Green Corridor, Inc. will partner with the Minnesota DNR and a host of other federal, state and local government agencies, non-profit organizations and the public to elevate the development of appropriate recreational opportunities tied to these lands (i.e., hunting, fishing, bird watching, park and trail use, and more). In all instances, recreational development will be considered in flexible combinations where feasible and with an educational component, when appropriate. This shared landscape legacy paradigm will serve as a model for balancing the preservation of the important ecological, historical and cultural resources within the Minnesota River Valley, while providing for the development of recreational opportunities that can be educational learning experiences when visitors are in the field or on the trails.

The Green Corridor board will regularly meet, discuss and update specific action items related to the implementation of this conservation plan, as an ongoing component of its responsibilities. Results and progress toward organizational goals will be compiled annually and will be available via the organization's shared web site at: *www.tatankabluffs.com*

Start Spinning:

Rumplestiltskin lamented for his inability to be able to spin straw into gold. Seldom in life are we given opportunities to spin straw into gold, but when that opportunity arises, we must not only recognize it, but must also start spinning and engage others to follow our lead. The opportunity of re-connecting the fragmented habitat blocks within the Minnesota River Valley is one of those rare occurrences. Let's start spinning and reconnect this fragmented landscape. Come, join us in this great endeavor!

Loran Kaardal
Board Member
Green Corridor, Inc

Executive Summary

The Middle Minnesota River Valley is recognized widely for its rich diversity of natural, historical and cultural resources. In 2008, funding from the Legislative and Citizens Commission on Minnesota Resources enabled the development of a Conservation Blueprint and Action Plan to prioritize and guide program activities of Green Corridor, Inc. toward the restoration, conservation and protection of these invaluable resources. This plan recognizes the importance of these resources to the State of Minnesota and its residents – Native American, Euro-American and other cultures – and provides recommendations that serve to ensure that they are both maintained and utilized in manners that balance the needs of today, while preserving them for future generations.

The resources of the Minnesota Valley have origins that extend back thousands of years before the present time. The native prairies, woodlands and forests of the region were shaped by climate, fire, and grazing patterns and influenced by the local Native American Indian inhabitants. Their village sites, burial mounds and other features provide the first historical/cultural sites in the Valley. Arrival by Euro-Americans and their interaction with the Dakota added to the historical/cultural story, culminating with the devastating U.S. – Dakota Conflict of 1862. The past 150 years has witnessed a considerable loss and degradation of the natural resources of the Valley, such that just over 2 percent now remains. Although strides have occurred in protecting some of the major historical/cultural resources of the Valley, much has been lost and much remains to be done.

The Mid-Minnesota Valley Conservation and Action Plan

The Conservation Blueprint and Action Plan is a bifurcated plan, with two components focusing on natural resources, and cultural and historical resources. Both components followed a process of: 1) identification of conservation targets that served to focus the plan, and their locations within the project area, 2) identification of threats to these resources and their sources, and 3) identification of strategies to abate those threats and conserve the resources going forward. The natural resources plan is built around a robust existing data set resulting from comprehensive inventories of the Minnesota County Biological Survey. The historical/cultural plan, on the other hand, is based on preliminary information obtained through widely available state sources and locally through experts; a much more in-depth assessment of the cultural/historical resources of the project area is required to bring this plan up to the level presented in the natural resources counterpart.

The Natural Resources Conservation Plan

Focal conservation targets of the natural resources plan included all natural ecosystems occurring in the project area and 62 species tracked by the Minnesota Natural Heritage Program as being of statewide significance. Conservation priorities stemming from the natural resources plan encompass a mere 9.2 percent (77 square miles) of the project area and are located principally within the Minnesota Valley proper. Over 80 percent of the project area is considered a low conservation priority, much of these lands being agricultural uplands farther removed from the Valley. Although land acquisition efforts by public agencies have done a good job of targeting

areas of high resource value, over 75 percent of all lands ranked as good, very good or outstanding value are held by private landowners, suggesting a need for targeted conservation programs and outreach to these individuals.

Threat-specific conservation strategies were identified to alleviate impacts associated with seven key threats to natural resource values: Agriculture, Mining, Invasive Species, Development and Urbanization, Hydrologic Alterations, Point Source Pollution, and Aquifer Depletion. In addition, five key overarching strategies were identified to address pervasive issues that impact natural resource conservation as a whole: Civic Engagement, Capacity Building, Communication, and Economic Development. Finally, three key policy arenas were identified where engagement with local and state governments might have an impact: Farm Policy and Subsidies; Minnesota Drainage Law, and Zoning.

The Cultural/Historical Conservation Plan

The cultural/historical conservation plan focused on a suite of nine conservation targets (themes) that served to capture a full array of historical and cultural sites of significance in the project area: Dakota Culture, Native American Indian Culture, Early Commerce, Religion, Military, Transportation, Historic (Ghost) Towns, Important People, and Other. Thirty-nine historical/cultural sites were identified in the plan, occurring in each of the nine target themes. However, sites principally relate to Military (44 percent) and Dakota (33 percent) themes, acknowledging the importance of these themes in the project area. Approximately half of all identified sites are considered protected.

Due to challenges in procuring data related to important sites within these themes, no prioritization was undertaken. Rather, we point to an overarching need for an in-depth cataloguing of historical/cultural features in the project area as a pre-requisite to such a prioritization.

Conservation Strategies were developed around 8 principal threats: Development and Urbanization, Loss of Knowledge, Land Use and Land Use Legacies, Maintenance Deficiency, Economic and Social Changes, Insufficient and Inadequate Conservation Standards, Tourism-Related Degradation and Loss, and Lack of or Inadequate Protective Heritage Legislation.

Going Forward

With a vision for “creating a landscape of habitat connectivity, public access and economic viability in the Mid Minnesota River Watershed,” the Green Corridor Board and its partners will use this conservation and action plan to make that vision a reality on the ground. Within those partnerships, a full complement of conservation tools will be employed to protect, preserve, restore and provide appropriate public access to these ecological, cultural and historical resources.

Conservation in the Middle Minnesota Valley: A Blueprint and Action Plan

Green Corridor, Inc. is a 501 (c)(3) non-profit conservation organization based in Redwood Falls, Minnesota that has as its mission the creation of a legacy of habitat connectivity, public access, and economic viability in the Mid-Minnesota River Valley Watershed. The *Minnesota River Valley Green Corridor Blueprint and Action Plan* was recommended for funding to state legislature by the Legislative Citizen Commission of Minnesota Resources through a grant to the Southwest Initiative Foundation and Green Corridors, Inc. Great River Greening was contracted to begin the development of this plan in 2008.

The purpose of this Conservation Blueprint and Action Plan is to prioritize and guide future program activities of Green Corridor, Inc. and other stakeholders toward the restoration, conservation and protection of both natural and cultural/historical resources of the Middle Minnesota Valley. The Minnesota Valley is recognized widely for its rich array and diversity of important resources. This plan recognizes the importance of these resources to the State of Minnesota and its residents – Native American, Euro-American and other cultures – and provides recommendations that serve to ensure that they are both maintained and utilized in manners that balance the needs of today, while preserving them for future generations.

Balancing the needs of long-term protection and resources use cannot succeed without strong involvement by a diversity of key stakeholders with interests in the Valley. This Plan will be a tool to assist and organize future stakeholders into a working partnership team committed to the vision for a *Green Corridor* in the Minnesota River Valley, and will assist in planning and implementing strategic activities that create or expand outdoor recreational opportunities and foster increased economic vitality and tourism in a region of Minnesota that is showing significant signs of population and economic decline.

To this end, the authors lay out the Plan in a format that first describes the project area and places its current natural and historical/cultural resources within a historical context essential in crafting a long-term conservation plan. This is followed by a review of existing information pertaining to both natural and cultural/historical resources in the Valley and an overview of the methodology utilized for assigning conservation priorities. Finally, results of the prioritization are discussed, coupled with a review of identified strategies that may serve to move this effort forward in meaningful ways.

Images: Tufto, Buck in Snow, Fort Ridgely - © Ron Bouldan; Canoer - © Loran Kaardal

Figure 1.1: River in the fall
©Brad Cobb

1. The Middle Minnesota River Valley - Its Resources and Its People

The Middle Minnesota River Valley, as defined for this conservation plan, encompasses 450 square miles along a 45-mile reach of the Minnesota River in south-western Minnesota, buffered laterally from the river 5 miles in both directions (north and south). The project area extends from the Upper Sioux Agency State Park (southeast of Granite Falls) on the upstream end to Fort Ridgely State Park at Highway 4 (south of Fairfax) on the downstream end; Redwood and Renville Counties are at the core (Figure 1.2). The project area is situated within the Northern Tallgrass Prairie ecoregion, as defined by The Nature Conservancy (1998) and Minnesota's Prairie Parkland Province (MN DNR 2010).

The Minnesota River Valley owes its origins to the Wisconsinan Ice Age, when a 2-mile thick sheet of ice parked itself over much of Minnesota. With its retreat approximately 12,000 years ago, meltwaters pooled in a series of large glacial lakes at the southern terminus of the ice sheet, the largest of which was Glacial Lake Agassiz. The largest freshwater lake ever known to occur on Earth, it extended from present-day west-central Minnesota north to the retreating ice front (Figure 1.3). During a cataclysmic event approximately 9,700 years ago, the waters of Lake Agassiz broke

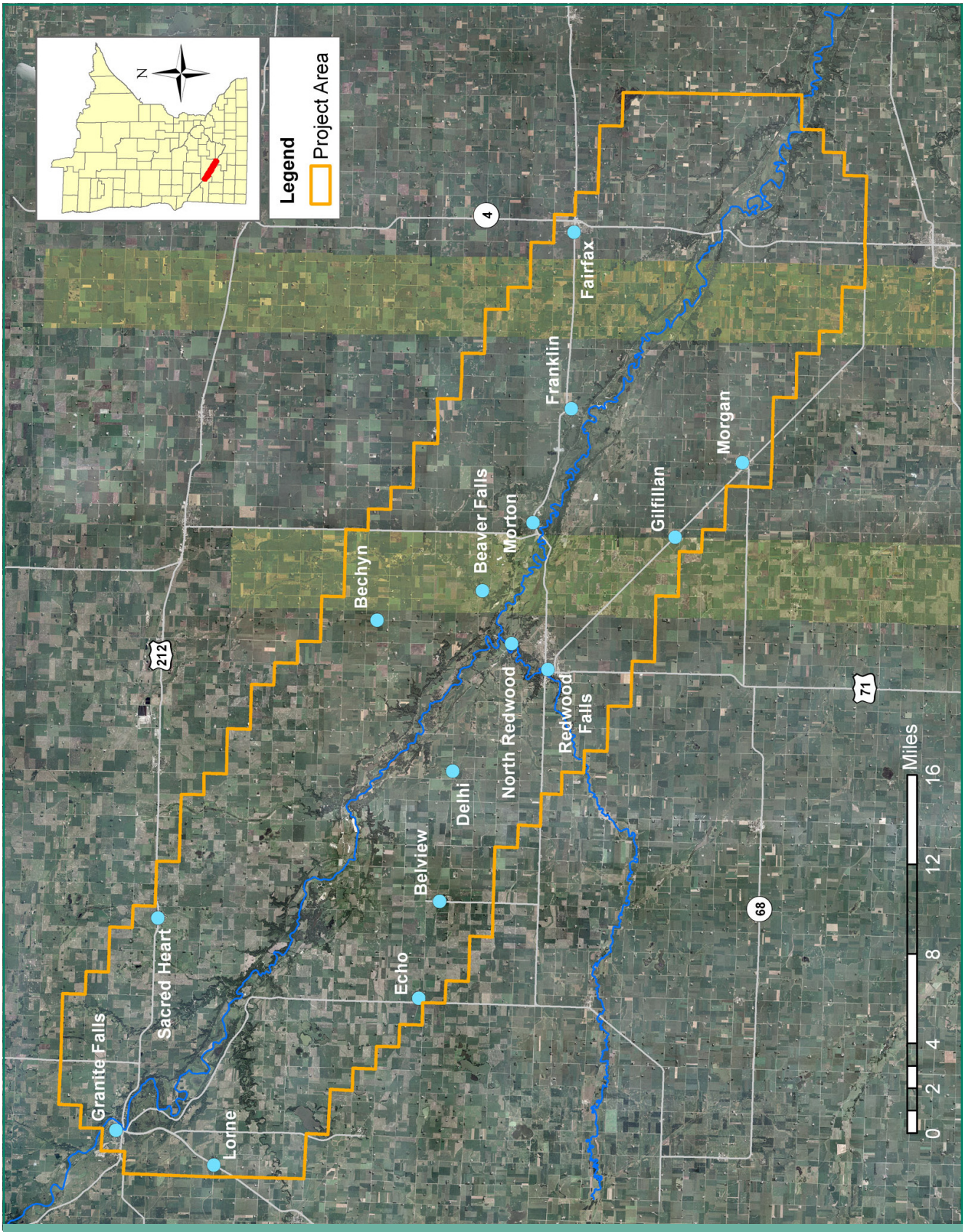

Figure 1.2: Minnnesota River Valley Green Corridor and Surrounding Area

through a natural earthen dam, releasing a torrent of floodwater – Glacial River Warren – that carved a 200-foot deep channel (down to bedrock in many places) through which the more diminutive Minnesota River now flows (Fisher 2004). The result is one of the state's most scenic and historic landscapes that displays unique geology (e.g., 3.8 billion year-old granite rock outcrops), plant communities (Minnesota DNR 2007b), cultural history, and sites that provide reminders to the most devastating settlement history in all of Minnesota – the U.S. - Dakota Conflict of 1862.

Figure 1.3: Glacial Lake Agassiz
©Minnesota Historical Society

The current climate of the project area is much different than that of 10,000 years ago. Situated centrally within the North American continent, the existing climate is characterized as continental, with frigid winters and hot summers. Average temperatures range from 73˚ F in July (on par with the average US temperatures this time of year) to 12˚ F in January (well below the U.S. average). Precipitation averages just over 4" in June (above the U.S. average) to approximately 0.6" in December and February (below the U.S. average).

Notes and maps compiled by government surveyors conducting the General Land Office's Public Land Surveys across the region (1858-1864) provide the most detailed documentation of vegetation within the project area immediately prior to Euro-American settlement (Minnesota Land Management Information Center 2010). These notes, compiled in map form for the entire state in 1930 by Marschner (1974), illustrate that tallgrass prairie was the dominant vegetation type in the project area, giving way in more fire-protected areas to forests, woodlands and savannas. An array of animal life (including bison and elk, now extirpated) inhabited the region, having evolved with and adapted to the ecological forces that shaped the region's character and that of the broader Great Plains.

1.1 Humans in the River Valley

The Minnesota River Valley has supported humans for much of the past 9,000 years, as evidenced by the Browns Valley Man find in the Upper Minnesota Valley, dated at 9,160 years before present. Warming climate, facilitated by the use of fire by early inhabitants, gave rise to the grassland biome in Minnesota and across the Great Plains. In turn, these grasslands shaped the culture of the people living there. Many cultures of native people resided in the Valley over the last 9,000 years, coming and going as the climate and environment changed. The Dakota, who are most associated with the Valley, occupied the area only after 1700 (Table 1.1).

Table 1.1: Native American Indian Traditions in the Minnesota Valley

The following section in italics is excerpted from the Institute for Minnesota Archeology (2010) web site: http://www.fromsitetostory.org/stculture.asp.

Paleo-Indian Tradition

As the post-glacial climate warmed, the vegetation during this period changed from tundra and spruce forest to mixed deciduous and coniferous forest, with prairie to the west. The Paleo-Indian tradition is thought to have included small, nomadic groups of people who hunted large mammals such as woolly mammoth and the giant bison present in the region. Archaeologists estimate these people followed a nomadic lifestyle from about 12,000-8,000 years ago. This cultural period is associated with various forest types and it probably witnessed the warming climate and the changing of forest to grassland in this part of the North America and Minnesota.

Archaic Tradition

The cultures living at this time (8,000-3,000 years ago) are thought to have been the more western prairie inhabitants who hunted bison, in addition to the more eastern woodland inhabitants who were general hunters and gatherers.

Woodland Tradition

During the Woodland tradition (3,000-350 years ago), changes in the landscape, climate and vegetation of the Minnesota River Valley were slowing down and the resulting cultures are thought to have been more stable or least more sedentary. Ceramics, earthen mounds and horticulture started to appear during this time.

Plains Village/Oneota/Mississippian/Missouri Traditions

Traditional nomadic hunting and gathering was slowly becoming a basic subsistence and settlement pattern (1,000-350 years ago). This change was made possible through the development of limited horticulture and ceramics. Crops such as corn, beans and squash were cultivated. There is evidence of long-distance trading between complex regional cultures. People of this cultural time period located habitation sites on islands, peninsulas and isthmuses of lakes. Later they moved to terraces above floodplains, which allowed them easy access to floodplain gardens that were easily cultivated and watered.

Dakota People and Culture

The Dakota have lived in the Lower Minnesota River Valley since at least 1700 A.D. Accounts of the Dakota Culture can be found alive today in the stories told by current members of the tribes (Mdewakanton, Wahpeton, Sisseton and Wahpekute) and by historical records from European explorers, missionaries, traders and settlers. In essence, their lives centered on the changing seasons and the resources that were seasonally available in the Minnesota River Valley for use in food, shelter and clothing. They were the dominant culture in central and southern Minnesota.

Tensions Grow

Understanding current demographics and tensions between cultures in the Minnesota Valley necessitates a review of the past two centuries and interactions between Euro-American explorers, missionaries, traders, settlers, the U.S. government, and the Dakota who lived in the area.

Figure 1.4: Treaty of Traverse des Sioux 1851
©Minnesota Historical Society

In the mid-1800s, numerous treaties were signed between the Dakota and U.S. Government that resulted in the ceding of large portions of Dakota land to the United States. Of these, the most significant occurred in 1851 with the treaties of Traverse des Sioux and Mendota. The former (between the United States and upper bands of Dakota [Sisseton and Wahpeton]) and the latter (between the United States and lower bands of Dakota [Mdewakanton and Wahpekute]) resulted in the ceding of 24 million acres of land to the U.S. Government, thereby confining tribes to a 20-mile wide reservation along the Minnesota River (10 miles laterally in both directions from the river) (Figure 1.4). In 1858, the tribes ceded the 10-mile strip on the north side of the Minnesota.

With the signing of the two treaties, the U.S. Government promised payments of approximately $3 million and annuities for the ceded lands; in addition, Upper Sioux (near present-day Granite Falls) and the Lower Sioux (near Morton) agencies were created at this time.

The culmination of unfulfilled treaties, reservation encroachment, continued western expansion, and crop blight in the spring/summer of 1862 was the tipping point in the Valley. In August 1862, Dakota leaders were convinced by tribal members that it was time to rise up against the settlers (Meyer 1993; Neill 1882). The resulting war lasted for barely more than a month, but resulted in hundreds of casualties among Euro-Americans and Dakota alike. The war ended with a decisive battle at Wood Lake and the release of 262 captive white women and children at Camp Release. Many of the Dakota fled to Dakota Territory and north into Canada to escape capture or death. After the war, all treaties with the Dakota were declared null and void by the United States government and all Dakota were effectively banned from the state.

Corn as High as an Elephant's Eye

The U.S. - Dakota Conflict led to a lasting change in the landscape of the Minnesota River Valley. Former reservation lands were opened for settlement not long after the conflict ceased. By this time, the Homestead Act of 1862 (which gave settlers 160 acres of free land for filing a claim and improving the land) had been enacted, providing for a ripe opportunity for settlement by Euro-Americans. Change happened quickly.

Renville County was created by state legislature in 1855, and significant settlement had occurred along the north banks of the Minnesota River by the time of the U.S. - Dakota conflict in 1862. Most of these settlements were abandoned until the area began repopulating in the mid-1860s, and it was not until 1866 that the county was fully organized. Unlike Renville County, Redwood County was not established until 1865, due in large part to the fact that it was largely located within the existing Dakota reservation.

The Homestead Act of 1862 - gave 160 acres of undeveloped land outside of the original thirteen colonies to heads of household who were 21 years of age or older, and who had not taken up arms against the United States. With this land acquisition, applicants agreed to file a claim, improve the land (build a dwelling and cultivate), and file for a deed of title. After five years, the original filer was entitled to the land free and clear (NPS 2009).

The Timber Culture Act of 1873 - gave 160 acres of additional free land if filers set aside 40 acres to grow trees to solve the problem of lack of wood on the Plains. After planting the trees, the land could only be completely obtained if it was occupied by the same family for at least 5 years. After this period of time, a certificate of ownership could be obtained for $30. Lands acquired under this Act were frequently called, "Tree Claims."

After the Conflict, settlement of both counties began again in the mid-1860s, and then more earnestly in the 1870s. Lands that had not been surveyed prior to the Conflict were surveyed from 1864-1868, and were officially opened for settlement shortly thereafter. In Redwood County, lands were surveyed in 1864, opened for settlement in 1865, and offered at public sale in 1867 (Neill 1882).

Settlers began arriving via the Minnesota River, established roads, and across the prairie. Railroads arrived in southern Redwood County in 1872 (Winona and St. Peter Railroad) and reached Redwood Falls in 1878. The Chicago, Milwaukee and St. Paul Railroad reached Renville County in 1878, followed by the Minneapolis and St. Louis Railroad in 1882.

Towns of Redwood Falls, Renville, Olivia, Morgan, Fairfax, Morton and others emerged and flourished as commerce centers, supporting a diverse economic base catering to the immigrants that were arriving in search of free lands and new lives.

The rich agricultural lands of the Minnesota River Valley were readily tilled for agricultural production, and in a short 10-year timeframe much of what had been tallgrass prairie a few years prior had been converted. Ditching in earnest began in the first decade of the 20th century and continued for the ensuing two decades. By that time, Renville County boasted 3000 miles of drainage ditches. Agriculture was the principle economic game in town and the fortunes and failures that would ensue over the following century would be in large part tied to this agricultural base.

1.2 Impacts on Natural Resources

The primary ecological processes that shaped the natural character of the prairies of the Middle Minnesota River prior to Euro-American settlement were climate, grazing and fire, each operating at multiple scales, frequencies and intensities (Weaver and Albertson 1956, Axelrod 1985, Risser 1985, Anderson 1990). Fire, interacting with the effects of grazing and climate, promoted the development of the tallgrass prairie system. Seasonal precipitation and temperature patterns influenced the growth of vegetation, and consequently the availability of fuels for burning and forage for grazing.

Seasonal fires created a patchwork of burned and unburned areas across the flat prairie landscape. Bison and elk, the principal large herbivores, grazed preferentially on vegetation in burned areas because of greater productivity and nutritive quality of forage following fire (Risser 1985, Risser 1990, Collins and Gibson 1990, Ostlie et al. 1996). Their transitory grazing patterns allowed the vegetation to recover from intermittent and sometimes intensive grazing events. These grazing patterns further impacted the availability of fuel for fire and, in turn, impacted and helped maintain a subtle, yet important vegetation mosaic that provided an array of habitats for a diverse suite of grassland animal and plant species. People living on the land influenced these patterns (by hunting, setting fires, etc.) and thus played a large role in shaping the historic landscape prior to Euro-American settlement.

Yet, this grassland system was quickly moving out of kilter by the early- to-mid-1800s, well before wholesale settlement by Euro-Americans occurred. Many of the large native mammals were extirpated or were in serious decline prior to settlement and the subsequent conversion of habitat for agricultural purposes (Ostlie et al. 1996). By the mid-1800s, bison were largely extirpated from the ecoregion, with the last wild bison in Minnesota recorded in 1880; elk (*Cervuus elaphus*) were effectively eliminated by the late 1800s, disappearing from the state altogether in 1896 (Nordquist and Birney 1988). Wolves (*Canis lupus*) persisted in remote areas of the state, but were driven out of the prairie lands. Trumpeter swans (*Cygnus buccinator*) and whooping cranes (*Grus americana*) were extirpated from the ecoregion long before their marshes were drained (Green 1988).

The vast accumulations of carbon-rich organic soils – some of the most agriculturally productive sites in the temperate world – set the stage for settlement and exploitation of the state's prairie lands. The Homestead Act of 1862 was the catalyst that enticed throngs of Yankees and immigrants (Germans, Scandinavians, Irish and those of other nationalities) to try their luck in the American Northwest.

Euro-American settlement had a major impact on the landscape of the Minnesota Valley. In fact, few places in the world have experienced anthropogenic alteration to the extent documented in the tallgrass prairie regions of the central United States (Noss et al. 1995). Rapid settlement and conversion of the Minnesota Valley – much of it occurring in a mere 10 years (approximately 1870-1880) - transformed the great sea of grass that was the tallgrass prairie into an agricultural system with only small vestiges remaining on the landscape (Krenz and Leitch 1993). Today, less than 1 percent of the native tallgrass prairie remains in Minnesota; much of what remains is relegated to small, highly isolated tracts.

As upland prairie habitat was converted to agriculture, focus of settlers turned toward improving the productivity of land by removing water from the landscape. In 1883, state drainage law gave counties the authority to construct ditches or water courses, including the drainage of shallow, grassy, meandered lakes under four feet in depth (BWSR 2010). In 1897, the state drainage commission was established to "*have care, custody, control and supervision of all drainage ditches in the state*." Complex and pervasive systems of tiles, drainage ditches and river/stream channelization expedited water runoff from the landscape and did the job in terms of improving lands for agricultural purposes.

Ditching began in earnest in Redwood and Renville counties during the first decade of the 20th century, and continued in haste for another two decades. By that time, Renville County was boasting of having installed 3000 miles of tile and ditches (Rootsweb 2010a). Today, more than 90 percent of the presettlement wetlands have been lost from the tallgrass prairie region (Lant et al. 1995).

The conversion of prairie and other natural systems within the Northern Tallgrass has resulted in increased soil loss through wind and water erosion, and resultant water quality degradation within the majority of streams, rivers and wetlands in the region. The Minnesota River, for example, has often been referred to as the most polluted river in Minnesota, an outcome of the immense sediment and nutrient loads now carried by the river. Declines in freshwater mussel (Bright et al. 1990, Williams et al. 1993) and fish (Cross and Moss 1987) populations have been directly linked at least in part to the degradation of water quality resulting from erosion of agricultural lands.

1.3 The Minnesota River Valley Today

The Minnesota Valley today, although greatly altered relative to what it was in 1800, retains a rich cultural, historical, and natural heritage. Unlike uplands farther removed and now largely in agricultural production, the Valley retains a rich diversity of high-qualiy natural areas that provide home to an array of animal and plant species, and a glimpse into what the Valley was like 200 years ago. This rich diversity is reflected in a study of the state's natural resources conducted by the Minnesota DNR, where the Minnesota River Valley was identified as its priority focal area (Figue 1.5). Tied to this natural history are robust Dakota and Euro-American cultural heritages, each with important sites, events, and individuals that made and are making a mark on the local, state and national scene. In this section, we detail the current status of the natural and cultural/historical resources of the Mid-Minnesota Valley.

Figure 1.5 Minnesota DNR Southern Region Focus Areas

© Minnesota DNR

1.3.1 Natural Resources

The current ecological framework of the Minnesota River Valley today is at best, a patchwork of remnant ecosystems (Figures 1.6-1.9) scattered throughout the project area, but principally occurring between the bluffs of the Minnesota River Valley. Outside of the Valley proper, land is largely in agriculture production.

Remaining natural ecological systems in the project area include a mix of tallgrass prairie, woodland and forest types (see Appendix C for a complete list of ecological systems identified in the project area). Native ecological systems now account for a mere 2.15 percent of the total project area, a 97.85 percent decline over the past 150 years. Conversion of lands to agriculture has been the principle reason for this decline, although associated land use activities (grazing, logging, fire suppression and invasive species encroachment) have accentuated this decline.

Of the remaining native ecosystems in the Valley, approximately 75 percent are considered of moderate quality, with 20.5 percent of high quality, and 4.5 percent of outstanding quality. Without adequate long-term management, remaining examples are likely to degrade in quality over the coming years.

Row-crop agriculture is the principle land use in the project area, with corn, soybeans or sugar beats being the dominant crops planted. Agriculture land amounts to 87 percent of the combined acreage of Redwood and Renville Counties. The remaining 13 percent of land is divided amongst residential, municipality, industrial and public lands (SRF 2002; Biko 2007).

Natural resources that are extant in the project area today are bombarded by an array of threats to their quality and long-term viability. Principal threats to natural resources include:

Figure 1.6: Rock Outcropping
© Ron Bouldan

Figure 1.7: Floodplain Forest
©Great River Greening

Figure 1.8: Oak Savanna
©Great River Greening

Figure 1.9: Prairie
©Great River Greening

Water Resources

- Water quality degradation – sedimentation, elevated nutrient levels, erosion
- Abnormal spikes, duration and seasonality in flows
- Declines and loss in fish, mussel and other aquatic species populations
- Drainage and alteration of wetland and riverine habitat
- Exotic species

Terrestrial Resources

- Broad-scale conversion, fragmentation and degradation of native ecosystems
- Loss of natural processes that support native ecosystems and associated species (e.g., fire)
- Loss and decline of native species (elk, bison, birds, etc.)
- Exotic species

With the alteration of the natural processes under which the native ecological systems evolved (principally fire, grazing, and climate) as well as the arrival of non-native flora/fauna, has enabled select species to dominate and out-compete less aggressive species. In terrestrial systems, typical invasive species that are prevalent in the region include, but are not limited to: European buckthorn (*Rhamnus cathartica*), Exotic honeysuckle (*Lonicera sps.*), reed canary grass (*Phalaris arundinacea*), smooth brome (*Bromus inermis*), garlic mustard (*Alliaria petiolata*), leafy spurge (*Euphorbia esula*), Kentucky bluegrass (*Poa pratensis*), Canada thistle (*Cirsium canadense*), musk thistle (*Carduus nutans*), sweet clover (*Melilotus sp.*) and spotted knapweed (*Centaruea maculosa*). In aquatic systems, common carp (*Cyprinus carpio*) is major problem, impacting the quality of riverine habitat and competing with native fish species for resources. To date, zebra mussels (*Dreissena polymorpha*) have not been found within the project area, but pose a major threat none the less. Purple loosestrife (*Lythrum salicaria*), reed canary grass, cattail (*Typha angustifolia, Typha x glauca.*), and a host of other non-native species are principle threats to wetland systems across the project area. These species can out-compete less aggressive native species and/or alter the composition and health of natural systems.

1.3.2 Cultural

Demographics for the region were compiled in both the Redwood County Comprehensive Plan (Bilko 2007) and Renville County Comprehensive Plan (SRF 2002). The information for the two counties was combined to give a larger socio-economic view as it relates to the project area.

Population

The 2000 census data for both counties indicates a steady decline in population since the mid part of the last century (circa 1950). This trend is a result of residents leaving rural areas in favor of jobs and amenities in larger metropolitan areas. Together, the two counties have exhibited a population decline of 23.7 percent since 1960.

The majority of the population is composed of white Americans (92 percent), of which over 50 percent are of German ancestry (see Table 1.2).

Renville County currently posses a population of just over 17,000 individuals, with a population density of 18 people per square mile; Redwood County's population is just under 17,000 individuals, with a density of 19 people per square mile.

Median Income:

Renville County:

The median income for a household = $37,652; per capita income was $17,770. About 6.3 percent of families and 8.8 percent of the population were below the poverty line, including 10.8 percent of those under age 18 and 8.1 percent of those ages 65 or over.

Redwood County:

Median income for a household is $37,352; per capita income was $18,903. About 5.5 percent of families and 7.7 percent of the population were below the poverty line, including 8.3 percent of those under age 18 and 8.8 percent of those ages 65 or over.

Table 1.2: Population Composition

Age of Population:

Renville County: Median age = 40 years

Under Age 18	26.50%
18-24 Years	6.60%
25-44 Years	25.30%
45-64 Years	21.70%
65 Years +	19.80%

Redwood County: Median Age = 40 years

Under Age 18	26.50%
18-24 Years	6.60%
25-44 Years	24.80%
45-64 Years	22.700%
65 Years +	19.30%

Racial Composition:

Renville County (2000 census)

White	95.0%
Hispanic	5.1%
Native American	<0.1%
African American	<0.1%
Asian/Pacific Island	<0.1%
Other	3.5%

Redwood County (2000 census)

White	95.0%
Hispanic	1.1%
Native American	3.2%
Black	<0.1%
Asian/Pacific Island	<0.1%
Other	1.3%

Designing the Conservation Plan

Conservation planning in the Middle Minnesota River Valley was focused on two principal thematic areas – 1) natural resources and 2) cultural/ historical resources. Specific conservation plans were pursued and developed for each of these components independent of the other. Both identify, and to the extent possible, prioritize lands for conservation action within the project area. In addition, conservation strategies to realize long-term conservation of these important resources are detailed for each respective section. Each of these products will serve to enable informed judgments for resource conservation and prioritization of actions by those charged with the implementation of this plan.

Figure 2.1: Minnesota River Valley
©Brad Cobb

2. Natural Resources Conservation Plan

A standard protocol for assembling a conservation action was used for both natural and cultural/historical resources components of the overall plan. This protocol – adapted from The Nature Conservancy (2006) and World Wildlife Fund (2004) – uses the following process:

1. Identify Conservation Targets
2. Identify Threats to these Targets and their Sources
3. Develop Strategies to Abate these Threats
4. Measure Progress toward Established Goals

2.1 Conservation Targets

Conservation targets focus a conservation plan. They serve as the elements around which a plan takes shape. Targets identified for use in this planning exercise included: 1) all natural ecological system types (both terrestrial and aquatic) found within the project area, 2) all species tracked by the Minnesota Natural Heritage Program as Endangered, Threatened or of Special Concern, and 3) other species tracked by the Heritage Program for a variety of reasons, including Species of Greatest Conservation Need. This resulted in a total of 80 conservation targets - 17 terrestrial communities (Appendix C) and 62 species (Appendix B).

2.2 Assessing Viability and Ecological Integrity of Conservation Targets

In the context of natural resource conservation planning, viability or ecological integrity is the likelihood that a conservation target or its component occurrences (e.g., a specific population or example) will persist over a given period of time. This concept underpins any credible conservation plan. Viability is a function of a conservation target's condition, size and landscape context.

Viability = Size + Condition + Landscape Context

Blocks of habitat – as defined and mapped by the Minnesota County Biological Survey (for moderate- to outstanding examples of native ecological systems) and 2001 National Land Cover Database (MRLC 2010; for degraded native and all non-native systems, i.e., agricultural, urban or barren) – served as the framework around which the conservation plan was assembled. These habitat blocks in many ways served as surrogates for conservation targets (species and ecological systems). In turn, these blocks of habitat were linked to specific target occurrences (species and ecological systems) contained within them and provide a basis for estimating long-term persistence of these embedded conservation targets.

Figure 2.2: Key Elements: Assessing Vitality & Ecological Integrity

Size - the relative size of a habitat patch on the landscape. Larger blocks of habitat tend to support a more complete array of natural processes that sustain ecological systems over time, and support populations of species that are more viable than found in smaller examples.

Habitat Size

Score	***Size Class***
10	> 940 acres
9	590 – 940 acres
8	349 – 590 acres
7	244 – 349 acres
6	160 – 244 acres
5	93 – 160 acres
4	55 – 93 acres
3	30 – 55 acres
2	10 – 30 acres
1	< 10 acres
0	Agricultural, Developed or Barren

Condition - the quality of an ecological system or habitat patch relative to historic norms (pre-1850). Examples in excellent condition (i.e., devoid of invasive species, physical impacts and such) will tend to persist longer and support populations of species that are more viable than found in disturbed or degraded examples.

Habitat Condition

Score	***Condition Class***
10	Outstanding MCBS
9	High MCBS
8	Moderate MCBS
6	Natural, Lake, River
4	Semi-Natural
2	Agricultural
0	Urban/Developed

Landscape Context - The position of natural or semi-natural habitat patch relative to other habitat patches, and the impact of neighboring lands on a habitat patch. Patches isolated from others are more likely to suffer from edge effects, and therefore are less resilient in the face of threats and supportive to a full array of species over time.

Landscape Context

Score	
10	Intact Landscape
8	Largely Intact
6	Moderately Intact
4	Moderately Fragmented
2	Highly Fragmented
0	Isolated Patch

In this conservation planning process, a protocol was developed for assigning numeric scores for each viability/ecological integrity factor (size, condition, or landscape context) to each specific habitat block, as detailed in Figure 2.2. Although specific relationships between these three factors are highly target-specific, general guidelines related to target viability hold true: 1) large habitats are better than small ones; 2) pristine natural conditions are better than degraded ones; and 3) habitats surrounded by other natural habitats are better than natural habitats surrounded by highly altered systems (i.e., isolated). With this protocol in hand, numeric scores were assigned to blocks of habitat (as opposed to specific occurrences of conservation targets) occurring within the project area in order to rank habitat blocks relative to one another.

2.3 Assigning Conservation Priorities

Conservation priorities were established by building off of the viability/ecological integrity assessment as detailed in Section 2.2 above. Scores for each of the three factors were combined to produce a composite Integrity score ranging from a maximum of 30 points to a low of 0.

Along with viability/ecological integrity as an underpinning factor in assigning conservation priorities, two additional factors were included to further focus conservation priorities toward protecting lands that provided greatest conservation benefit as detailed in Figure 2.3. Therefore, a maximum total score for any habitat polygon is 50 points, with a minimum of 0.

Figure 2.3: Conservation Priorities

1) Number of occurrences of species tracked by the Minnesota Natural Heritage Program within a habitat patch. Highest point scores went to habitat patches with large number of rare species occurrences.

Presence of Rare Species

Score	*Number of Occurrences*
10	>11
8	5 - 10
6	3 - 4
4	1 - 2
0	0

2) Proximity to MCBS habitat patches. Points were awarded to lands in close proximity to MCBS quality habitat patches as a means of providing buffer to those important habitat remnants.

Proximity to MCBS

Score	*Distance*
10	Within MCBS
6	<1/8 mile from MCBS
4	1/8 – 1/4 mile
2	1/4 – 1/2 mile
0	> 1/2 mile

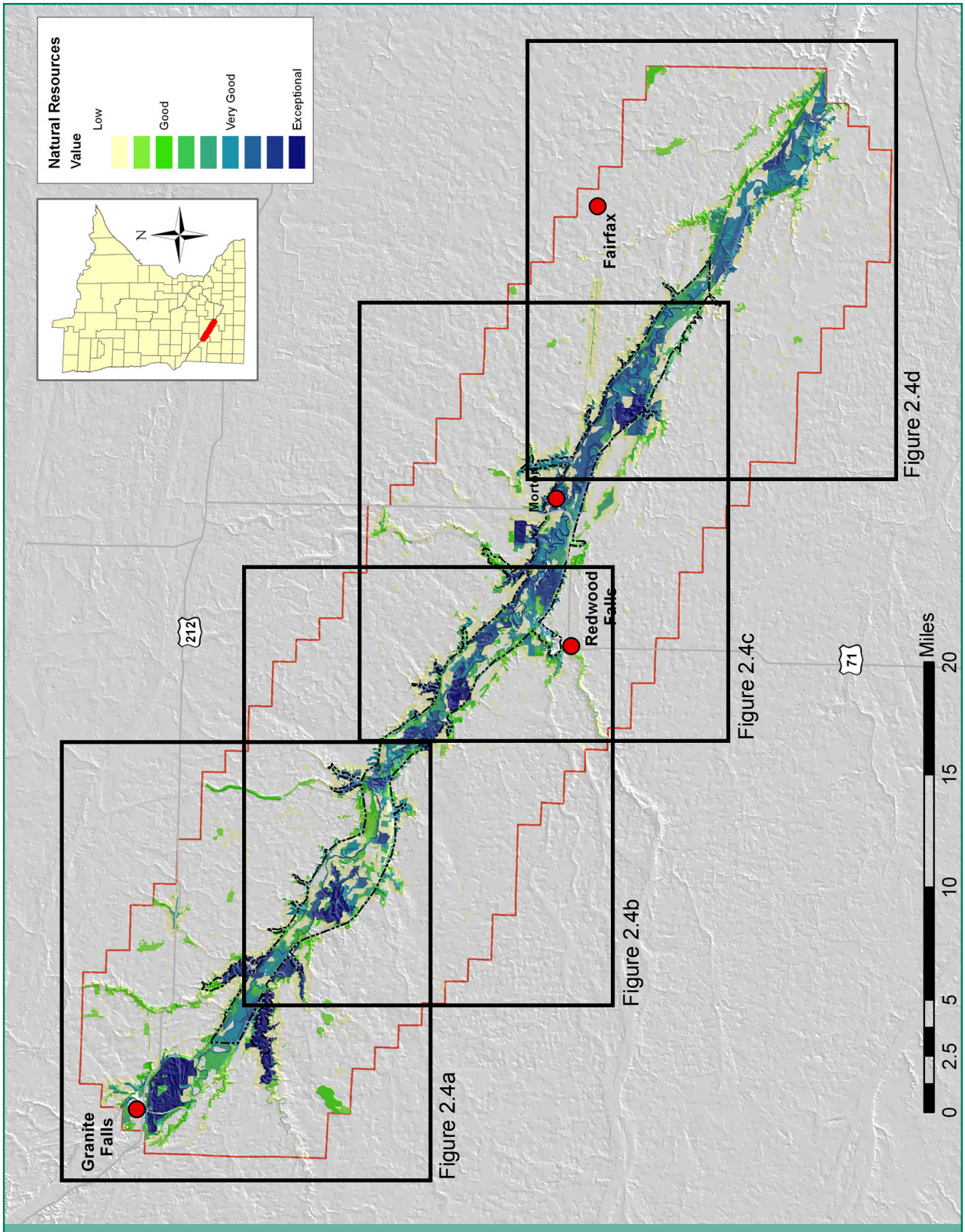

Figure 2.4: Middle Minnesota River Valley Natural Resources Opportunities

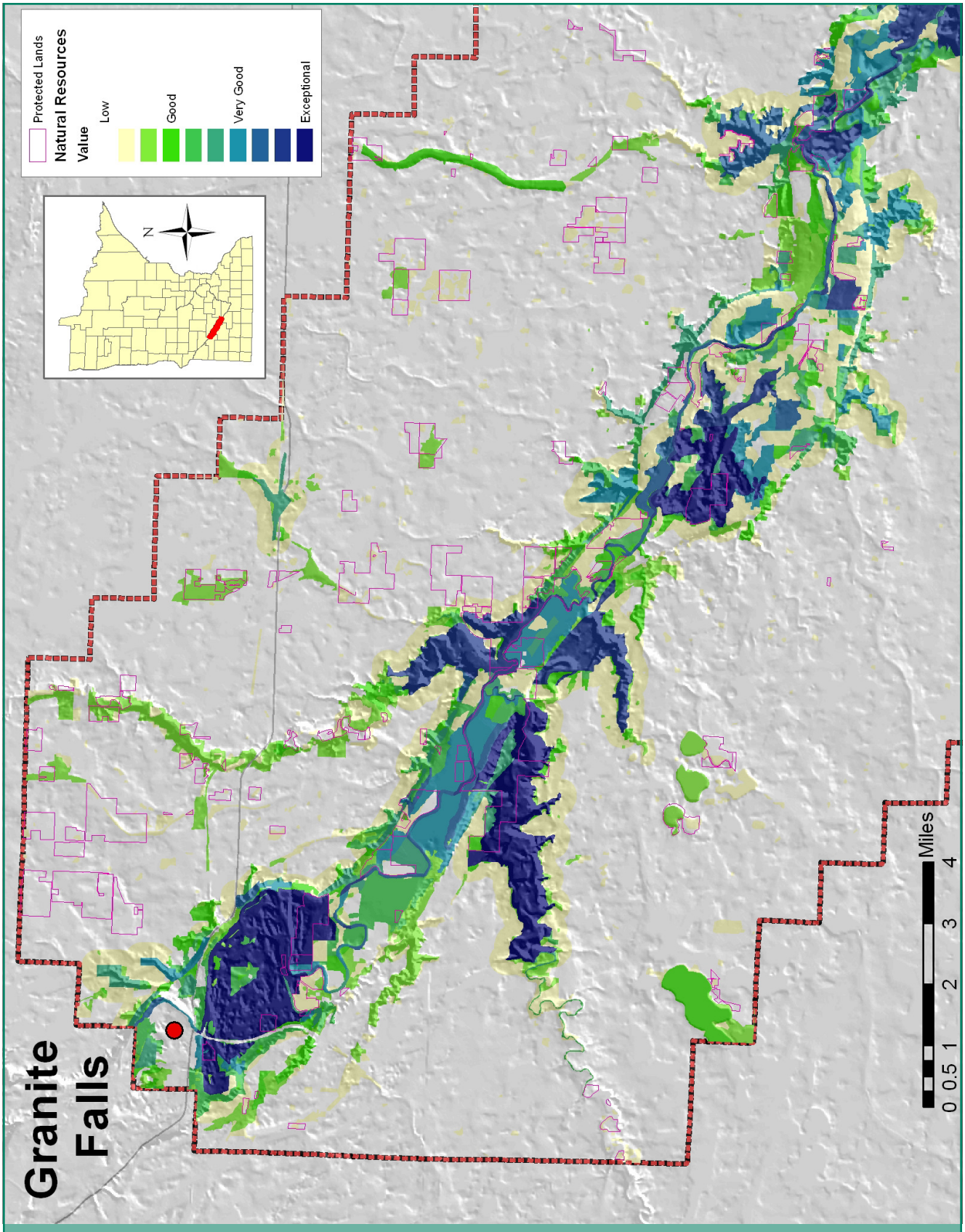

Figure 2.4a: Middle Minnesota River Valley
Natural Resources Opportunities & Protected/Managed Lands

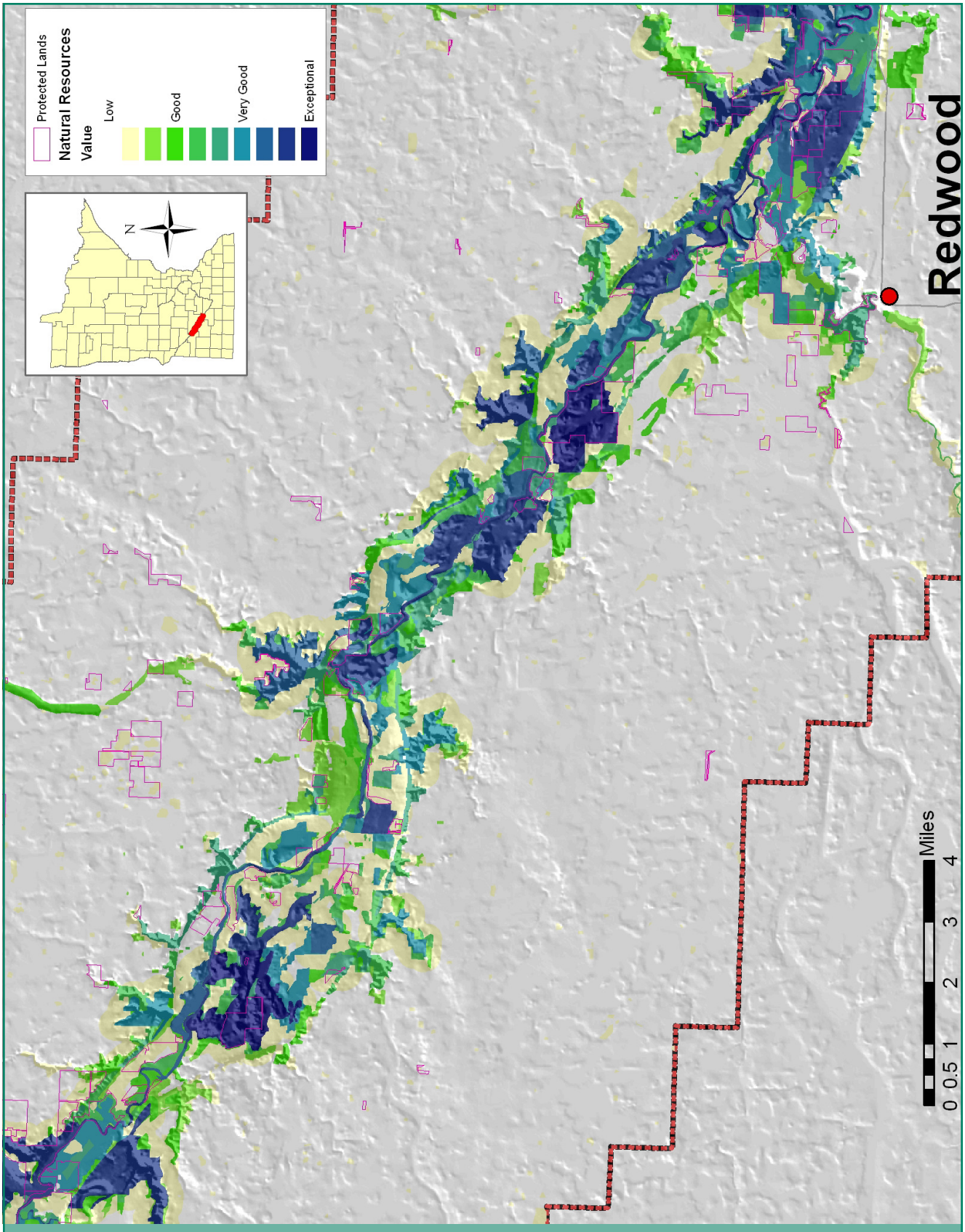

Figure 2.4b: Middle Minnesota River Valley
Natural Resources Opportunities & Protected/Managed Lands

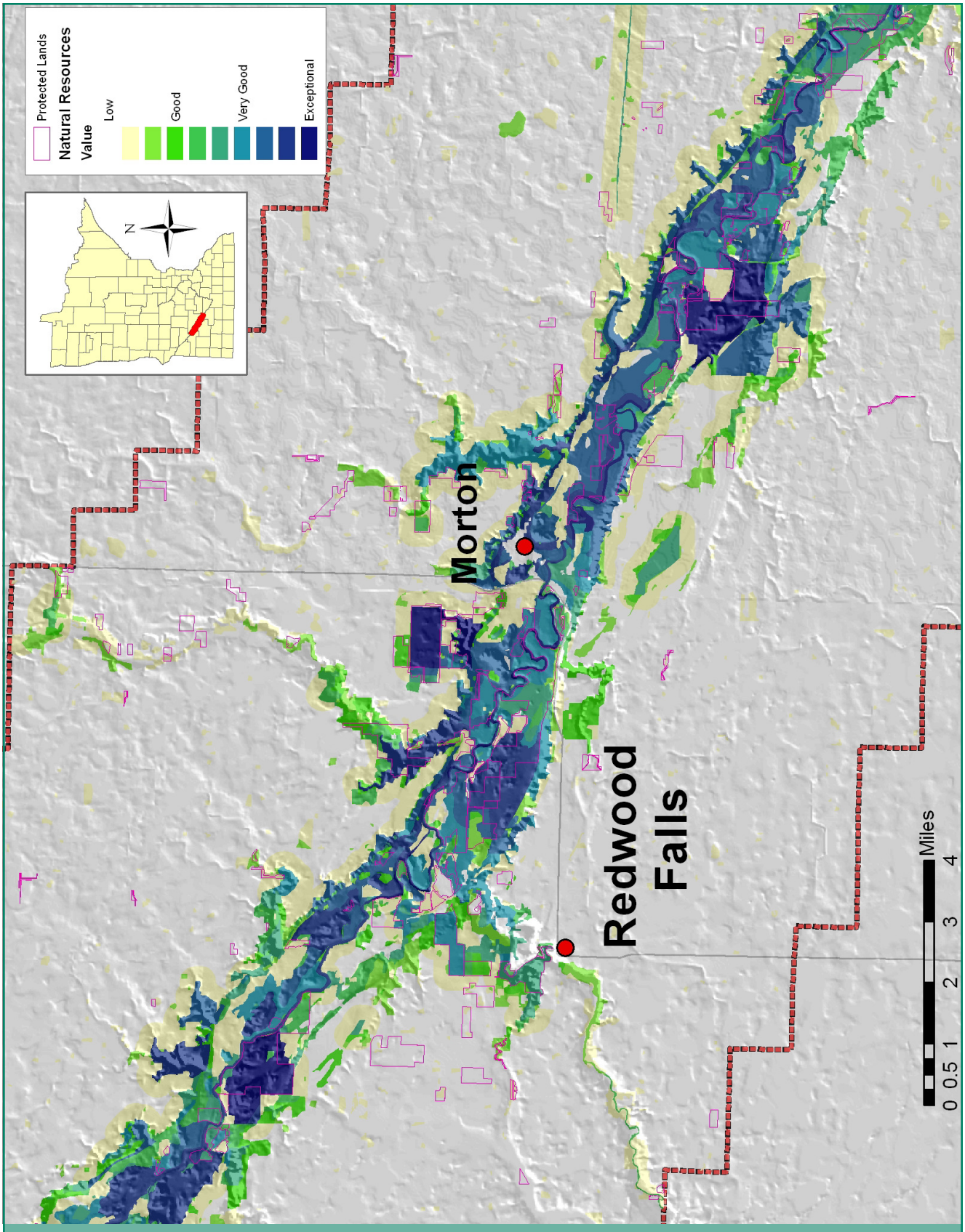

Figure 2.4c: Middle Minnesota River Valley
Natural Resources Opportunities & Protected/Managed Lands

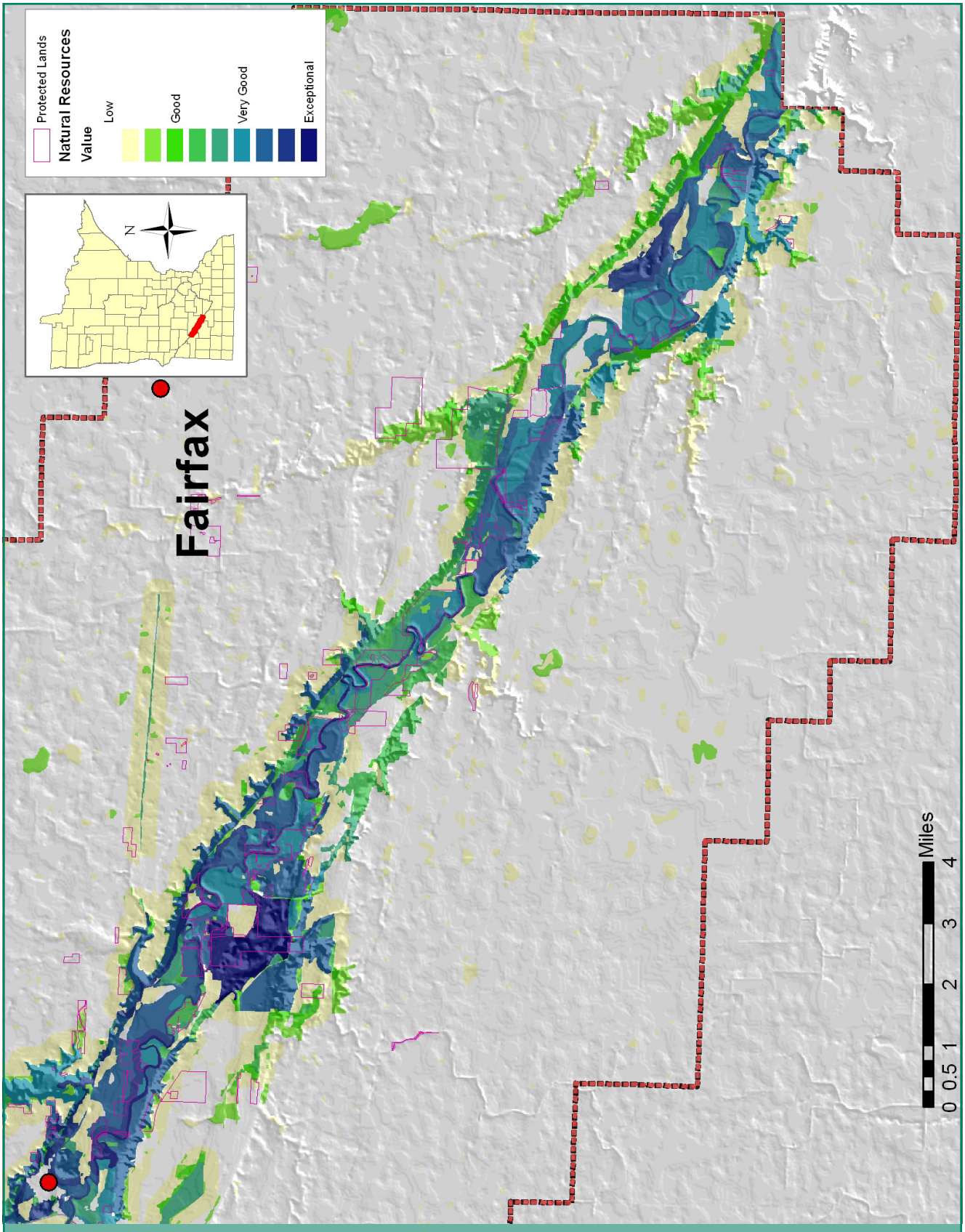

Figure 2.4d: Middle Minnesota River Valley
Natural Resources Opportunities & Protected/Managed Lands

Value	Area (Acres) within Category	Managed Area (Acres) within Category	Percent in Private Lands
Exceptional	12,283.75	2,883.75	76.52
Very Good	18,402.29	3,677.44	80.01
Good	18,963.29	3,699.78	80.49
Moderate	24,016.51	3,565.99	85.15
Low	372,515.88	14,857.84	96.01
Total	446,181.75	26,684.80	94.12

***Table 2.1**: Distribution of Lands Relative to Value Score*

The result of the prioritization process is detailed in Figures 2.4a - 2.4d and Table 2.1. An analysis of the product reveals that only 9.2 percent (49,649 acres; 77 square miles) of the project area is ranked in good, very good, or excellent categories; in large part, lands within these categories are within the Minnesota Valley and associated tributaries.

Alternatively, the vast majority of land within the project area (83.5 percent; 582 square miles) is considered low priority for conservation action. These lands typically have little or no remaining natural vegetation, are far removed from natural habitats, and have no target species associated with them. Much of this land is located on the flat agricultural uplands removed from the Minnesota Valley and its tributaries.

A review of conservation lands in the project area (i.e., those owned and managed by the Minnesota DNR, U.S. Fish and Wildlife Service, respective counties, and Bureau of Land Management; private lands with easements administered by the Board of Water and Soil Resources; and CRP lands with short-term agreements) illustrate that protection efforts to date have been skewed towards lands of good, very good, and exceptional value as determined through the prioritization process. Still, over 75 percent of lands in those categories are in private hands, suggesting a strong need to focus efforts on private landowners in the Valley.

It should be noted, however, that agricultural and other lands that scored low in this prioritization process may be priorities for conservation actions aimed at improving water quality in the Minnesota River and its tributaries. Because analyses for that purpose are best addressed along watershed lines (whose boundaries stretch far beyond those of this project area), and because ongoing TMDL and other planning efforts are already underway in the Minnesota Valley designed to this end, we did not attempt to duplicate those efforts here. Our prioritization is based largely on terrestrial systems, noting of course the direct linkage between the two that can be made in many areas of the Valley.

2.4 Threats and Ecological Legacies

Conservation, in its simplest term, is the abatement of threats to focal conservation targets. Threats (also called stresses), if inadequately addressed, can serve to undermine any action that is carried out under the banner of conservation. Without a strong recognition of threats and their sources, strategies embarked upon or implemented in the name of conservation can be ill-targeted and often fail. Similarly, restoration efforts initiated without an understanding of past activities, events, and the legacy of those actions (ecological legacies) may fail to achieve the desired results.

Threat: An activity or process that has caused, is causing, or may cause the destruction, degradation and/or impairment of biodiversity and natural processes.

Ecological Legacy: Lasting impacts on biodiversity and natural processes as a result of an activity or process happening in the past.

The legacy of past events can reverberate through ecosystems for hundreds to thousands of years (Dupouey et al. 2002). These legacies often become drivers of ecosystem function that may be otherwise hidden from a static view of landscapes in the present (Rhemtulla and Mladenoff 2007). Studies at forest and grassland sites across North America have shown that levels of P, C or N imposed by agriculture can endure for decades and centuries after practices have ceased (Foster et al. 2007). Soil horizons may take centuries to rebuild. Native

Table 2.2: Threats

Terrestrial Threats:

1) Land Use & Land Use Legacies
    - Habitat Loss, Conversion & Fragmentation
2) Invasive Species
3) Loss/Alteration of Natural Processes
    - Fire, Grazing
4) Development & Urbanization
5) Incompatible or Unsustainable Recreational Activities
6) Incompatible Ecosystem Management
7) Mining
8) Climate Change
9) Aquifer Drawdown

Freshwater Threats:

1) Invasive Species
2) Hydrologic Alteration
    - Surface Drainage & Hydrologic Alteration
    - Dams & Culverts
    - Elevation of Magnitude and Duration of Peak Flows
    - Floodplain Alteration
3) Non-Point Source Pollution & Runoff
    - Nutrient Flow – Land Use Practices
    - Erosion & Sedimentation – Land Use Practices
4) Climate Change
5) Point Source Pollution
    - Mining
    - Feed Lot Contamination
6) Aquifer Drawdown

prairies that exemplify what occurred pre-1800 may not be possible without reintroduction of bison and other herbivores (Collins et al. 1998). Research focused on stream systems has shown that modern composition and diversity of fish and invertebrates are best predicted by watershed land use occurring as much as five decades earlier (Harding et al. 1998).

All too often, acquisition is considered the "be all, end all" conservation action pursued, with little consideration given to the threats that have occurred, are occurring, or expected to occur at a given site. Often, acquisition may not be the most critical action required to maintain natural resource targets at a site. Rather, a robust suite of conservation tools designed with an eye toward ameliorating a full spectrum of threats (legacies of past actions/processes occurring at present, or expected to occur in the coming years) and targeted toward the specific conditions of an area should be considered.

As a key component of the planning process, principal threats to both terrestrial and freshwater conservation targets were drafted and reviewed during a workshop designed to propose a suite of conservation strategies to achieve conservation success in the Middle Minnesota River Valley. A list of those threats appears below; Appendix D lists these same threats, along with sources of each threat, and strategies identified to abate those threats. These strategies are discussed in the following section (2.5).

2.5 Conservation Strategies

Four identified for abating threats and conserving the unique and valued natural resources of the Middle Minnesota River Valley are numerous and highly varied (see Appendix D). Many of these arose in discussion during a Strategies Development meeting held in Redwood Falls on November 30, 2009. What follows below is a summary of priority strategies. We lead with several overarching strategies that pertain to conservation of natural resources as a whole, then lay out strategies targeting specific threats.

2.5.1 Overarching Strategies

Several identified strategies do not pertain specifically to a single or small group of threats, but are broadly applicable to natural resources conservation in the Minnesota River Valley as a whole. These include:

Civic Engagement:

The Challenge: Local individuals, business men and women, lawmakers, and children do not adequately know, respect or appreciate the inherent value of the natural resources in Mid-Minnesota Valley. As such, there exists little community support for long-term actions that can serve both to protect these resources and also drive economic revitalization in the Valley.

Strategies to Address the Challenge:

- Teach conservation and the environment to our students.
- Educate and inform elected officials.
- Build a culture of societal responsibility and civic engagement in the protection of natural resources.

Capacity Building:

The Challenge: Insufficient capacity exists at many levels related to the protection and long-term management of the region's natural resources. These capacity gaps exist among public land management agencies (DNR, USFWS, etc.), agencies that deliver services to private land owners (BWSR, SWCDs and NRCS offices), those tasked with enforcement of existing laws, and non profit organizations.

Strategies to Address the Challenge:

- Identify and procure resources to deliver on-the-ground capacity to address challenges, enforce laws and regulations, and implement strategies.
- Build broad partnerships among local, state and federal government agencies, non profit organizations and individuals to share limited resources and elevate impact.

Communication:

The Challenge: Strong and effective messages are required to elevate the recognition of the importance of natural resources in the Mid-Minnesota Valley, galvanize and inform local stakeholders, and successfully implement conservation strategies. These messages can be targeted locally to change an existing culture of apathy or to build an engaged citizenry, and at the state and national levels to build support among elected officials and government agencies.

Strategies to Address the Challenge:

- Develop and deliver focused communications, hitting key messages in a variety of formats, targeting key audiences.
- Market the conservation plan as a key conservation strategy, to build awareness and respect for the region's natural resources and the Minnesota River.

Economic Development:

The Challenge: Natural resource conservation is often viewed as the antithesis of economic progress. Yet, many vibrant economic centers have successfully blended economic progress with resource conservation, making them highly attractive places to live.

Strategies to Abate the Threat:

- Where possible and appropriate, link conservation strategies to economic development (e.g., recreational trail development).
- Use full cost accounting techniques to accurately detail costs and benefits related to proposed conservation practices.
- Pursue and showcase successful strategies designed to both build the local economy while building appreciation for the region's natural heritage (e.g., trails, Minnesota Valley History Center).

2.5.2 Threat-Based Strategies

What follows is a discussion of the primary threats to natural resources in the Middle Minnesota River Valley, and identified strategies to abate these threats.

Figure 2.5: Row Crop harvesting
© Ron Bouldan.

Key Threat 1: Agriculture

With agriculture being the primary use of land within the Minnesota Valley, it is not surprising that the majority of threats to natural resources stem from actions related to this activity. Many of the threats posed by agriculture can be characterized as ecological legacies, resulting from the large-scale conversion of prairie and floodplains, drainage of wetlands, and intensive grazing of blufflands and bottomlands. Threats – to both terrestrial and freshwater systems – playing out today are a result of intensification of agriculture practices, greater use of pesticides and fertilizers, development of larger animal containment facilities and feed lots, and are in many ways driven by the U.S. Farm Bill and other economic drivers operating on the landscape. Among these is the drive for ethanol production as an alternative fuel source. In coming years, threats are likely to emerge as a result of continued pressure to develop alternative fuel sources and the resulting intensification required to balance needs of fuel production and food supplies. The U.S. Farm Bill will continue to play a main driver on both the conservation and threat side of the equation.

Key Strategies:

- Ensure a strong and effective Farm Bill with economic incentives and associated conservation programs for natural resource protection, a Bill that gives farmers good options.
- Implement and enhance funding for the Conservation Stewardship Program (Farm Bill) that delivers commodity payments based on conservation practices.
- Influence development, enhancement and deliver effective use of state/federal programs – targeting private landowners – for wetland restoration, habitat restoration, erosion control, and associated protection efforts.
- Create incentives for permanent vegetation through economically attractive means (e.g., working lands for biofuels, grazing wildlife management areas behind fire, allowing for mid-term grazing of CRP lands).
- Enforce existing laws and regulations related to stream/river buffers and other areas by building capacity at the local level and awareness of laws/regulations by landowners.
- Track recommendations coming forth from Lake Pepin TMDL; develop/implement strategies in line with recommendations, tapping funding that will emerge to address stated need.
- Pursue protection of remaining natural areas on private lands through a variety of tools: acquisition, easements, and landowner agreements tapping federal and state cost-share programs.

Key Threat 2: Mining

Mining, although limited geographically within the project area, has had and is having a significant impact on the limited, remaining natural resources of the Valley proper. Two types of mining – hard rock associated with granite outcrops, and sand/gravel associated with alluvium and glacial drift – are found in the Valley, and threaten remnant prairies and rock outcrops. Quarrying of rock outcrops has emerged as a major threat in the Valley in recent years.

Figure 2.6: Sand/Gravel Quarry
©Great River Greening

Key Strategies:

- Pursue protection of priority remnant prairies and rock outcrops through conservation easements, acquisition, and landowner agreements. Focus RIM program efforts in priority sites; reinvigorate the State's Wild and Scenic River Program and protection that it can afford.

Key Threat 3: Invasive Species

Non-native and native species alike can be damaging to ecological systems (both freshwater and terrestrial) and their associated biota. An array of exotic species (e.g., European buckthorn, multiflora rose, leafy spurge, reed canary grass, smooth brome, Canada thistle, zebra mussel, carp) introduced via federal and state agencies, nursery trade, ballast dumping in the Great Lakes, and illegal import, are having an immediate impact and threaten the future of natural areas and lakes and streams within the project area. In addition, lack of fire and abatement of other natural processes have allowed trees and shrubs to invade remnant prairies, rock outcrops and oak savanna systems, modifying their composition and placing their continued existence at risk.

Figure 2.7: Buckthorn closeup
©Great River Greening

Key Strategies:

- Collaborate with state and federal agencies to eliminate exotic species currently included in their standard planting mixes.
- Outreach to the local nursery industry to ensure highly invasive cultivars are eliminated from stock.
- Develop and enhance effective eradication programs for invasive species at priority sites by bringing resources to bear through state and federal programs, non profit organizations, and local stakeholders.

- Build strong programs that bring local communities to bear in elevating resource management on public lands.
- Enact early detection/rapid response protocols for problematic species that are in very low densities or are on the verge of entering the Valley.

Figure 2.8: Subdivision Development
© Northwest Associated Consultants.

Key Threat 4: Development and Urbanization

Pressures on the natural resources of the Minnesota River Valley stemming from development and urbanization are significant. Land holdings along the River Valley, particularly in close proximity to existing towns, are being subdivided and sold as ranchettes or lots for homes. The River Valley, for those wanting to escape town living, affords a more attractive housing site than agricultural lands. As land ownership changes, opportunities for subdivision emerge.

The former glacial river bed is primarily riparian and is subject to annual spring flooding from Upper Sioux Agency State Park to Fort Ridgely State Park. The real development pressure will not be on the river bed itself, but rather along the sides of the former glacial river banks and the blufflands on top. These areas would be more susceptible to linear housing developments, which are common in the New Ulm and Mankato areas.

There is limited development potential on the south side of the Minnesota River in Redwood County due to:

- The lack of a township road running along the base of the bluff from Redwood Falls through the Lower Sioux Community. Most of the available upper bluff line has already been developed near Redwood Falls and there is a modest amount controlled by three landowners, east of the Lower Sioux Community.
- The presence of a commercial rendering facility and previous DNR acquisitions have limited development along the river bottom road to the west.

The greater residential development potential is on the north side of the River in Renville County due to:

- Accessibility provided by the river bottom road that stretches from one end of the county to the other, providing great access to the side bluffs of the river valley.
- Many of the existing coulees were developed a century ago as pioneer farm sites and additional rural residential development has occurred over the last three decades.

Key Strategies:

- Strengthen land use planning and zoning at the county level.
- Build relationships with key private landowners and acquire conservation easements on priority parcels through RIM, DNR Wild & Scenic River Program, or non-profit conservation organizations.

Key Threat 5: Hydrologic Alterations

Physical modifications to streams and rivers over the years, coupled with exacerbated flows (in magnitude and duration) due to wetland drainage and loss of upland vegetation, have had major impacts on freshwater systems and associated biota.

Key Strategies:

- Change the Minnesota Drainage Law which drives wetland drainage and stream/river channelization across much of the state.
- Enhance efforts to keep water on the land through wetland restoration and other practices, tapping and delivering funding through BWSR, MPCA, and an array of other state and federal programs, and non-profit organizations like Ducks Unlimited.
- Track and develop strategies linked to the Lake Pepin TMDL process which will set limits on nitrogen, phosphorous and sediment loads in the Minnesota River.
- Start small, working to implement an array of practices to achieve demonstrable change in small "proof of concept" watersheds.
- Remove obsolete dams on waterways to reestablish flow through river sections and allow for free movement of fish and other aquatic species.
- Create incentives through Farm Bill and other programs for putting permanent vegetation on lands.
- Expanding working lands concepts for biofuels production, grazing WMAs behind fire and so forth.

Key Threat 6: Point Source Pollution

Several types of point source pollutants pose noteworthy threats to natural resources in the Minnesota Valley, most notably mining, feed lot contamination, and septic systems.

Key Strategies:

- Enforce existing laws and regulations.
- Conduct assessment of septic systems along the Minnesota River and its tributaries; secure cost-share funding to correct problems.

Key Threat 7: Aquifer Depletion

Although not a major issue at present, this threat looms significantly larger in the near future as demands related to ethanol production expand, and into the future as climate warms and rainfall decreases.

Key Strategies:

- Tighten ethanol production regulations.
- Restore wetlands to increase aquifer recharge.

2.5.3 Key Policy Arenas

Farm Policy and Subsidies

Similar to other countries, the United States has sponsored farm subsidies since the early twentieth century. Farm policy and subsidies tend to ebb and flow in popularity depending on the current socio-economics. Farm policy itself is strongly tied to economics and protection of agricultural interests. These policies can, at times, be at odds with the natural resources conservation, while at other times can contain strong conservation incentives. Farm policy is directly tied to how much subsidy is available for placing agricultural lands into various conservation programs such as the Conservation Reserve Program (CRP), Wetland Reserve Program (WRP), Wetland Habitat Incentive Program (WHIP) and others.

Minnesota Drainage Law

Minnesota's extensive tracts of agricultural land rely heavily on an interconnected drainage network of ditches, channels and drain tile. This network operates to drain wet soils by expediting water from the land to local streams and rivers, to the detriment of the hydrological cycle of the region. This can cause greater amplitudes in stream and river flow relative to historic norms during spring runoff and major rain events. In turn, these transport systems can serve as direct conduits for sediment, chemicals and nutrients (e.g., phosphorus and nitrogen) directly into streams. The drainage law is overseen at the local level by a County Board, Joint Drainage Authority, Watershed District, or Soil & Water Conservation District (Busman 2002).

Zoning

Continued human population growth and landscape urbanization will create ongoing pressure on lands with the project area with natural and open space values. Although there is currently a lull in the market for lands as a result of poor economic conditions, pressures are likely to increase as economic conditions and land prices increase. This pressure will appear in the form of future city and subdivision expansion, along with single-home expansion in rural areas. Table 2.3 provides a summary of current zoning regulations related to residential diversity in Redwood and Renville Counties.

Table 2.3: Minimum Density - Redwood and Renville Counties

Redwood (residential minimum density)
MN Scenic River - 1 dwelling unit/5 acres (R-LD, Ag2, Minnesota River Valley Corridor)
Agriculture - 1 dwelling unit/2.5 acres (Ag1, R1)

Renville (residential minimum density)
MN Scenic River - 1 dwelling unit/5 acres (Minnesota River Valley Corridor)
Agriculture - 1 dwelling unit/40 acres
Rural Residential – 1 dwelling unit/5 acres

Minnesota Scenic River Regulations

Both Redwood (Redwood County 2009) and Renville (Renville County 2009) counties have land use ordinances that apply to the State of Minnesota's Scenic River Regulations.

Permitted uses of land within the scenic river district of both counties are largely identical, and include opportunities for governmental campgrounds, public access and trails, agriculture and forestry, sewage treatment facilities, private roads, single family residential housing, and governmental open space recreational uses.

Conditional uses (those requiring a conditional use permit), although largely similar between the two counties, have some notable differences. Private campgrounds, temporary docks, private open space recreational uses, public roads and mining are considered conditional uses in both counties.

Table 2.4: County Zoning Differences

Principle differences in Scenic River zoning between the two counties fall in the following areas:

Conditional Use	**Redwood County**	**Renville County**
Livestock operations	Not listed	>300 animal units
Transmission corridors	Not listed	Power lines and pipelines
Zoning Dimensions		
Lot width at building line	250 feet	300 feet
Subdivisions		
Land unsuitability	Not addressed	None for unsuitable lands
Planned unit development	Not addressed	If clustering allows for better protection of ag land, open space, scenic views, wetlands and other features.

Agriculture and Rural Residential Regulations

Lands within the project area outside of the Minnesota Scenic River District (i.e., uplands beyond the Valley proper) are also subject to zoning restrictions. Again, differences between Redwood and Renville Counties occur relative to minimum lot size for new residential development. Redwood County provides a minimum residential lot size of 2.5 acres, while Renville County requires a lot size of no less than 5 acres [rural residential] (Biko 2007, SRF 2002).

3. Cultural/Historical Resources Conservation Plan

The Cultural/Historical Conservation Plan follows the principal framework established for developing the Natural Resources Conservation Plan. However, unlike the Natural Resources process, this planning process lacked comprehensive data sets to effectively drive a planning and prioritization process. Despite repeated attempts to procure data from both state and local sources, a robust data set was not achieved; this paucity of data had significant implications related to the outcomes of the plan. These are discussed in the following sections of this report. Still, the results of this undertaking are noteworthy.

3.1 Conservation Targets

Conservation targets selected for the cultural/historical component of the Middle Minnesota Valley Conservation Plan include sites and features that effectively tell the story of the area. Through several workshops and meetings, nine principle themes were identified to focus this plan:

- Dakota Culture – Historic village sites, sacred sites, etc.
- Native American Indian Culture – Archeological sites (pre-1700) timeframe
- Early Commerce – Mining, milling, agriculture, quarrying, retail
- Religion – Missions, churches, cemeteries, etc.
- Military – U.S.- Dakota Conflict of 1862, forts, etc.
- Transportation – Railroads, ox cart trails, ferries, early roads, etc.
- Historic (Ghost) Towns – Historic towns and associated features
- Important People – Local people on a regional/national stage
- Other – Noteworthy sites that do not fall into one of the above categories

3.2 Building the Conservation Plan and Assigning Priorities

Within each category, identification of sites were pursued that served to capture the full breadth of these historical/cultural themes as they played out within the project area.

Challenges in Procuring Data

From the onset, the data compilation strategy from which to build this conservation plan hinged on a “top-down, bottom-up” process of gathering data available through the State Historic Preservation Office (SHPO) and other state and federal sources, augmented by data supplied at the local level through county historical societies and local experts.

This approach, although attractive in many ways, failed to produce the quantity and quality of data required to build a robust conservation plan. Although we obtained a full complement of historic and archeological data for the project area from SHPO, data restrictions made it impossible to share this site-specific information with

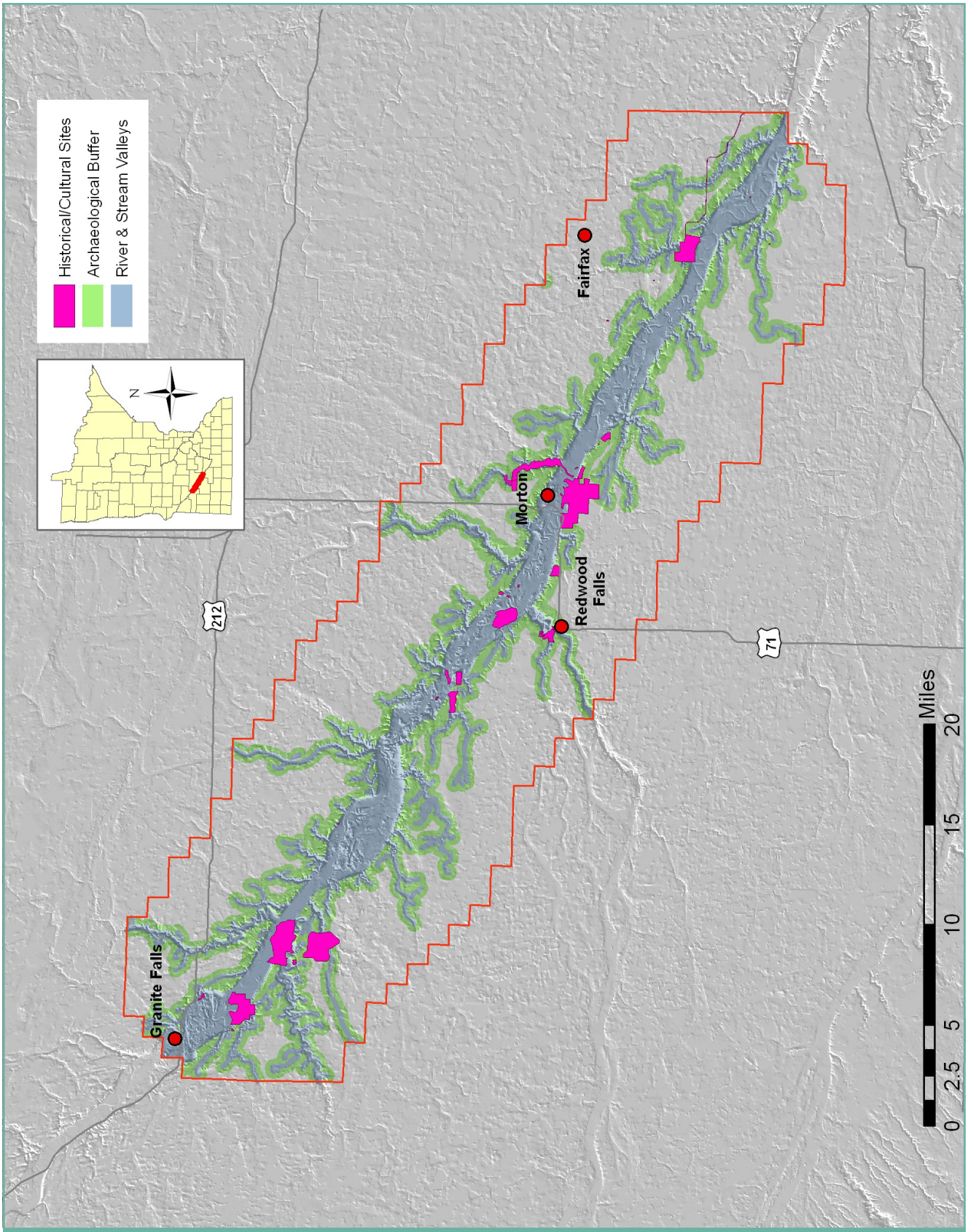

Figure 3.1: Minnesota River Valley Green Corridor Historical/Cultural Opportunities

[Adjust Map color layout]

project partners or include it in the conservation plan per se. Our approach at the local level was to identify and request assistance from experts in providing site nominations, spatial maps, and supporting data related to important historical sites within the categories identified above. That approach, although partially successful, failed to produce as expected. As a result, the process adopted for assembling a conservation plan around these features was considerably different than that described for natural resources. As such, this conservation plan – although identifying an array of important historical and cultural sites and strategies to conserve them – lays the groundwork for a more robust, locally-led process that should follow in the near term.

Outcomes

Local input from knowledgeable experts served to identify 39 historic/cultural sites within the project area, representative of each of the 9 principal themes (Figure 3.1). However, sites principally relate to Military (44 percent) and Dakota (33percent) themes, acknowledging the importance of these themes in the project area.

***Table 3.1**: Identified Historical/Cultural Sites by Theme*

Theme	Number of Sites
Dakota Culture	13
Early Commerce	8
Religion	7
Military	16
Transportation	4
Historic (Ghost) Towns	5
Important People	6
Pre-Dakota Culture	0
Other	3

For each nominated site, we compiled both a spatial boundary (to the extent that was obtainable) and associated tabular data (see Appendix E). Spatial boundaries of sites were drawn to encompass all features necessary for the protection and interpretation of the resource from a historical standpoint. Breakdowns of identified sites relative to each of the respective themes are detailed in Figure 3.1.

Pre-1700 archeological sites associated with the broader Native American Indian theme were excluded from the mapping exercise due to their sensitivity. Instead, a probability map depicting likelihood of encountering archeological resources was developed by Great River Greening, based on distance from existing water sources (Table 3.1).

Assigning Conservation Priorities

Due to the paucity of data associated with historic sites in the Middle Minnesota Valley, the project managers and project Executive Committee determined that it made little sense at this time to assign conservation priorities to sites. Rather, a more thorough, locally-led historical assessment should be undertaken in the near future to augment data collected through this effort, which would in turn lead to a compelling prioritization process. It is unlikely that direct action by Green Corridor, Inc. will be taken specifically to conserve historical features in the coming half decade, allowing time to make the historical/cultural plan more robust.

When undertaken, we propose that priorities be set around the following criteria:

- Historical significance of the site (global, national, regional, statewide, or local)
- Condition of the site (excellent to poor/degraded)
- Interpretive value (high to low)

Approximately half of all identified sites are considered protected. The level of protection afforded identified sites to date by theme shows that most protected sites in the project area are associated with the U.S. – Dakota Conflict of 1862. Few sites related to early commerce, transportation, etc. are protected and their historical story is largely untold. A more intensive conservation planning process in the future should ensure that all of these themes are adequately addressed.

3.3 Threats and Historical Legacies

Cultural and historical resources in the Middle Minnesota Valley are threatened by an array of direct and benign stresses. These threats stem from the lack of a thorough assessment and knowledge/understanding of historical/cultural resources in the region, insufficient financial resources, capacity, and legal covenants to protect and maintain those that are known, and inadequate appreciation/support among local communities and legislative representatives to make protection of these resources a priority. A list of identified threats to historical/cultural resources in the Middle Minnesota Valley appears below; Appendix D lists these same threats, along with sources of each threat, and strategies identified to abate those threats.

Principal Threats:

- *Development & Urbanization* – loss and degradation of resources due to encroachment via urban sprawl, loss through development and urban revitalization, and other associated actions.
- *Loss of Knowledge* – loss and degradation of resources due to inadequate documentation of history (especially at the local level) leading to an inability to locate and interpret historical sites, and a failure to recognize the importance of sites.
- *Land Use and Land Use Legacies* – loss or degradation that has already occurred stemming from a variety of historical sources (agricultural conversion of lands, etc.).
- *Maintenance Deficiency* – loss and degradation through insufficient resources to protect and maintain sites over time.
- *Economic and Social Changes* – loss and degradation due to changes in perceived value of sites by stakeholders, particularly in dire economic times.
- *Insufficient and Inadequate Conservation Standards* – loss and degradation of resources due to insufficient and inadequate application of conservation standards to historical/cultural resources.
- *Tourism-Related Degradation and Loss* – loss and degradation due to the over-use and inadequate protection of resources by visitors.
- *Lack of or Inadequate Protective Heritage Legislation* – loss and degradation as a result of inadequate protective legislation at the local, state, or national levels, and/or the enforcement of existing legislation.

A global assessment by the International Council on Monuments and Sites (ICMOS 2010) identified a suite of resources at risk across the world. Many of these globally threatened resources are also threatened in the Middle Minnesota Valley as well, and include:

Rural and Vernacular Architecture

Modest, traditional buildings and places are especially vulnerable because of their transient materials and unassuming character.

The risks include:

- Lack of recognition for simple vernacular heritage and thus lack of legal protection;
- Loss of traditional building skills;
- Loss of function, leading to lack of maintenance;
- Redundancy, neglect, abandonment or imposed modernization.

Figure 3.2: Beaver Falls Town Hall
©Gary Revier

Industrial Heritage

With rapid changes in technology and socio-political structures, industrial complexes of heritage significance are under pressure for redevelopment or modification. Sites located in urban areas are particularly vulnerable, as land values, living conditions and environmental expectations and controls change. The large scale of some redundant sites is often attractive for incompatible redevelopment, and their pragmatic value as real estate is seen to outweigh their heritage values and interpretative potential for adaptive reuse.

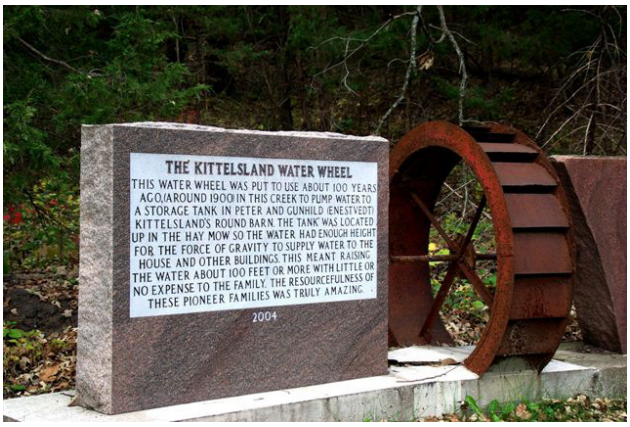

Figure 3.3: Kittelsland Water Wheel
©Ron Bouldan.

Major issues faced by industrial heritage sites include:

- Scale and complexity forcing economical rationalism to prevail in reuse decisions;
- Lack of widespread vocal support constituency;
- Location in prime redevelopment areas;
- Environmental management (e.g. remediation) precluding heritage values.

Religious Heritage

Changes to religious practice and observances are a major threat to heritage worldwide. The complexity of the functions of religious buildings - spiritual, public, social and administrative - can support some flexibility of use, but for many the lack of congregation, or changing worship practices have led to abandonment or massive internal changes. Parish churches are often neglected or adapted for other functions, not always with respect for or regard to the spirit of the place.

Risks affecting religious buildings include:

- Unsuitable use for other purposes;
- Lack of maintenance.

Archaeological Sites

Lack of adequate inventories to locate archaeological sites is at the root of this problem, as are increasing acts of vandalism to these sites. Physical damage through land conversion to agriculture and other practices also poses significant threats. Natural forces are also the enemy of these sites - erosion by wind and water threaten artifacts and sites alike. Urban development poses the threat of sudden destruction.

Threats affecting archaeological sites include:

- Illicit excavations, particularly in remote sites;
- Resource extraction;
- Infrastructure development, such as roads, bridges and dams;
- The antiquities trade.

Figure 3.6: Tepee
Redwood County Historical Society

Dakota Values and Places

An ongoing challenge is the appropriate recognition and conservation of Indigenous values in landscapes, sites and communities. Much work is needed to negotiate appropriate conservation protocols in diverse cultures - from the cultural and social necessity of maintaining language, to the identification and protection of cultural sites, to recognizing the intangible values in spiritual landscapes, and to the importance of specific sites of conflict or contact.

3.4 Conservation Strategies

Strategies identified for abating threats and conserving the nationally significant cultural and historical resources of the Middle Minnesota River Valley are numerous and highly varied (see Appendix F). Many of these arose in discussion during a Strategies Development meeting held in Redwood Falls on November 30, 2009. What follows below is a summary of the priority threats and strategies that emerged.

Development and Urbanization

Pressures on the historical/cultural resources of the Minnesota Valley stemming from development and urbanization are significant. Important features throughout the project area are being lost through development and urbanization.

Key Strategies:

- Initiate land use planning at the county level.
- Pass zoning language for historic districts and implement at the county level.
- Build relationships with key private landowners and acquire historic conservation easements on priority features through non-profit organizations.
- Develop a robust historical/cultural conservation plan to drive conservation action.

Loss of Knowledge

Critical information related to historic and cultural sites, unless adequately captured through historical documents, is being lost daily as memories fade, local community member pass away, and sites degrade.

Key Strategies:

- Conduct a comprehensive inventory of historical/cultural features in the Middle Minnesota Valley, and identify priority sites for conservation action.
- Undertake research to accompany the above inventory in order to understand and set priorities for conservation action.

Maintenance Deficiency

Lack of maintenance is perhaps the single most important threat facing historical resources in the Middle Minnesota Valley. Often, historical surveys have not been conducted to identify buildings and sites of historical value. As a result, landowners, communities and government officials fail to recognize the historical significance of a given building, site or feature. Buildings – whether occupied or not – degrade over time without sufficient resources put toward their maintenance.

Key Strategies:

- Conduct comprehensive inventory of historical/cultural features in the Middle Minnesota Valley, and identify priority sites for conservation action.
- Develop cost-share funding, tax relief or other funding sources to alleviate cost of maintenance by owners.
- Develop and implement attractive and convincing marketing/education campaign to raise awareness of resources and build endowment to fund maintenance over the long term.
- Develop or lure an effective historical/cultural nonprofit organization to the Valley to begin the work of conserving and managing these important resources.

Economic and Social Changes

Economic downfalls can destroy the best intentions and programs that were put in place when funds were plentiful. Successful, long-term solutions are required that provide funding sources that withstand economic downturns and social changes within a community.

Key Strategies:

- In companionship with a viable protection campaign, set aside funding for a maintenance endowment.
- Develop innovative practices that serve to maintain historic buildings while making them attractive for continued use.

4. Going Forward - Taking Conservation Action

4.1 How to Use the Plan

Conservation planning as a discipline has evolved significantly over the last decade. Where once the emphasis was on a completed plan, the focus of conservation planning today lies with its products – the underpinning data and maps – and how they will be effectively used by the many conservation organizations, and federal, state and local units of government working within a project area. In the end, the strength of a given plan lies not with the plan itself, but in how effectively it is used in achieving conservation success. This change in focus from a hard-copy product to an effective decision support tool is at the heart of this transformative change in planning. Far too often, planning processes have failed to impact on-the-ground conservation; although looking nice, many have been quickly relegated to the proverbial and literal bookshelves.

Figure 4.1: Looking down a tributary to the Minnesota River ©Brad Cobb

The Middle Minnesota River Conservation and Action Plan reflects this evolution in conservation planning. At the onset of the planning process, project managers in conjunction with Executive and Facilitation committees reached consensus that this undertaking would result in strong deliverables that could be used by a broad suite of practitioners to inform their actions within the project area. To this end, the planning process produced the following deliverables:

- A conservation plan for both historical/cultural and natural resources (via hard-copy, CD and worldwide web),
- Large-scale, plotter-sized maps of natural and cultural/historical resources (available on CD and via the worldwide web), and
- GIS shapefiles for respective coverages (available on CD and via the worldwide web).

Resource prioritization maps and shapefiles produced through this planning process are intended to serve as:

- Vehicles through which the proposed conservation actions of an organization – whether fee-title or easement acquisition, restoration, or delivering state cost-share programs to private landowners – are vetted.
- Visual resources around which groups of stakeholders and conservation practitioners jointly discuss collective strategies, laying out long-term game plans to achieve demonstrable impact.
- A tool for land management agencies in reviewing existing site-based management plans informed by a broader regional context.

As a means of showcasing the utility of these tools to potential users, we provide two illustrative examples. Although drawn from actual data in the Middle Minnesota Conservation Plan, it is important to emphasize that these examples are put forward merely for illustrative purposes only, and are not meant to promote or suggest that these strategies are being considered by any respective stakeholder.

4.1.1 Illustrative Example 1

Key Players:

Minnesota Department of Natural Resources - protects the state's natural heritage by conserving the diversity of natural lands, waters, and fish and wildlife that provide the foundation for Minnesota's recreational and natural resource-based economy.

Green Corridor, Inc. - is a non-profit conservation organization dedicated to the conservation and recreational use of the Middle Minnesota Valley. The organization is interested in assisting the DNR in meeting its goals in the project area, but also providing greater recreational access to and along the river valley corridor.

Overview:

The Minnesota DNR manages a state wildlife management area (WMA) along the south bank of the Minnesota River. The WMA captures a significant portion of an area characterized as having exceptional natural resource value; some areas of lesser quality are also included within the WMA. The DNR has identified this area as being

a cornerstone to its conservation efforts in the Middle Minnesota Valley, and is willing to employ a variety of strategies to achieve its goals in protecting areas of exceptional natural resource value and species of greatest conservation need that live in the Valley and on the WMA.

A review of the resource prioritization map relative to existing managed areas (Figure 4.2) finds the following:

- Two areas of exceptional natural resource value in private hand immediately adjacent to the WMA. These include a large area of approximately 50 acres off the west edge of the WMA, and a smaller 15-acre area sandwiched between two legs of the WMA along its south border.
- Three areas of lesser quality (very good to low natural resource value) are included within the WMA: 1) northwestern corner along the Minnesota River, 2) southeastern corner along the Minnesota River, and 3) a small inclusion in the center of the unit.
- A small privately-owned tract of land enrolled in the Reinvest in Minnesota (RIM) program (a perpetual conservation easement program held by the State of Minnesota) is located adjacent to the Minnesota River along the northwest corner of the WMA.

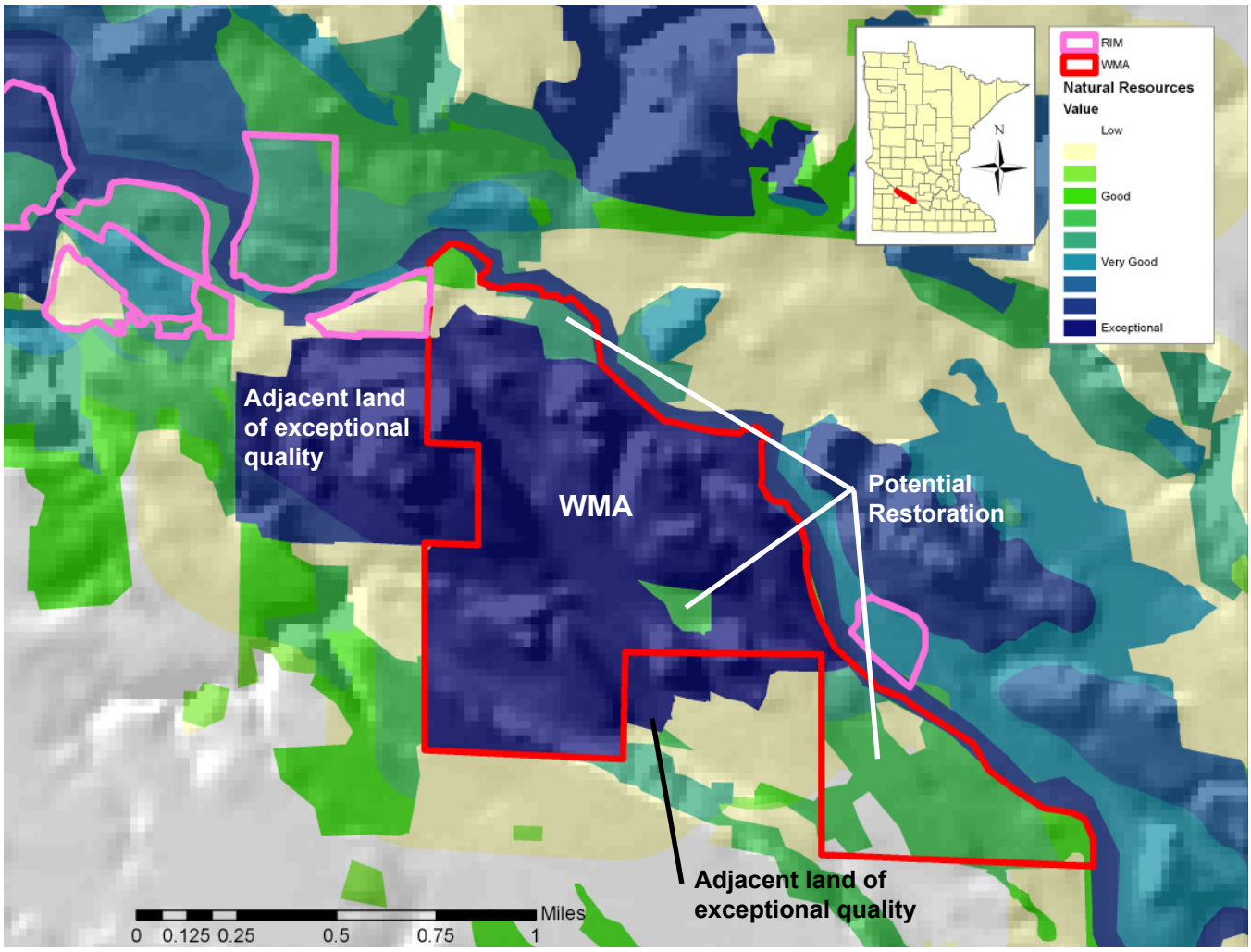

Figure 4.2: Illustrative Overview Example 1

- Privately owned lands of low to very good natural resource quality are located adjacent to the WMA along its south and western borders.

Illustrative Strategies

Based on this overview, a number of potential strategies might be employed to enhance conservation of existing state investments and areas of exemplary natural resource value located in the project area. These are described below, but reference Figure 4.3:

Strategy 1: Fee Title and Easement Acquisition

Both areas currently in private ownership but of exceptional natural resource value (given their proximity to the existing WMA) are likely candidates for acquisition. Acquisition of these parcels – via directly by MN DNR or via Green Corridor, Inc. – would not only protect the high quality resources on these lands, but also afford greater protection to resources now partially protected within the WMA. Acquisition of the private land located along the managed area's south border would strengthen the linkage between two existing legs of the WMA and provide a better corridor for species movement along the valley.

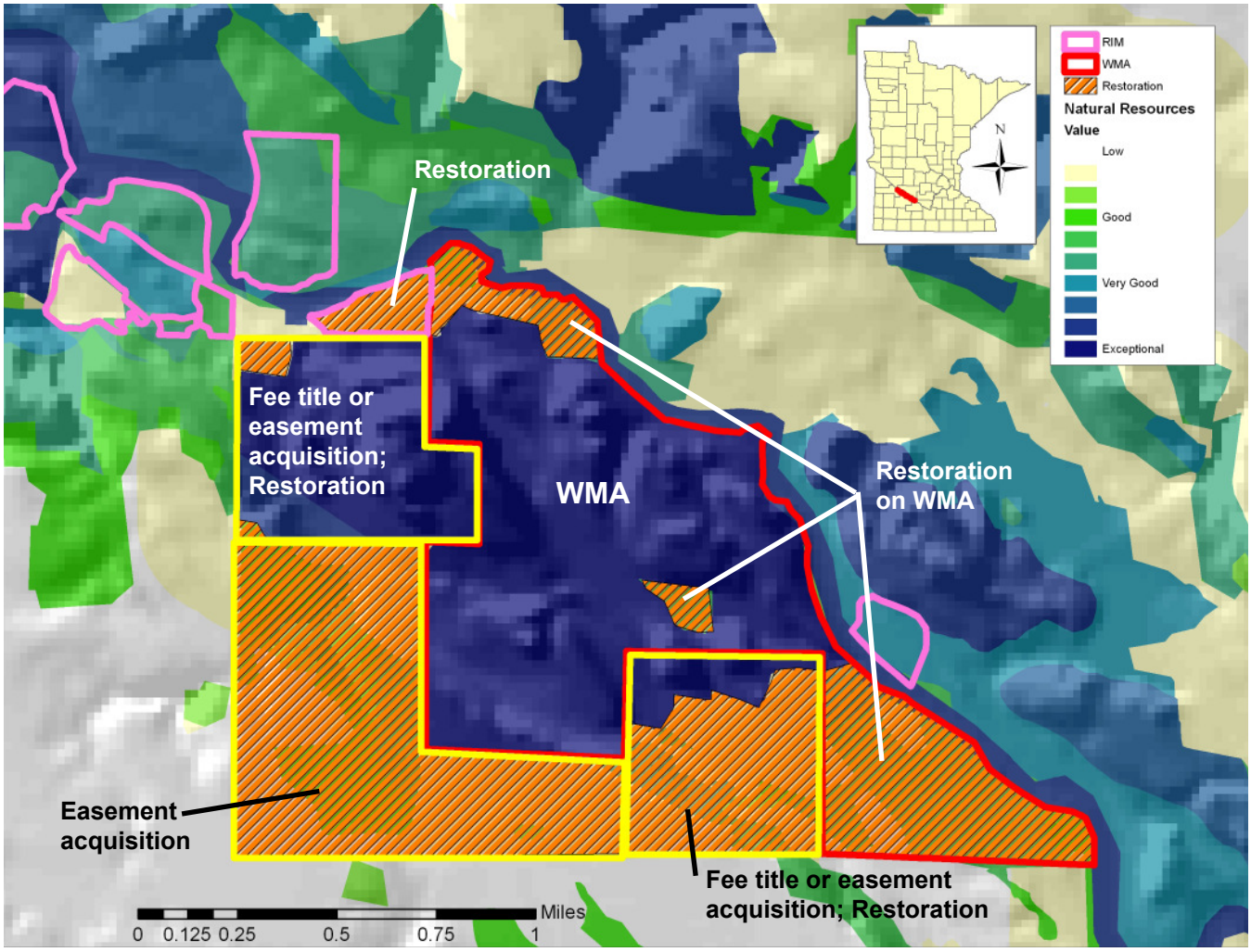

Figure 4.3: Illustrative Strategies Example 1

If landowners are unwilling to sell, the DNR might pursue long-term conservation easements on these same tracts as a mechanism for affording limited but critical conservation action. In addition, easements might be warranted on other private lands immediately adjacent to the WMA (south and west borders) as a way to offer greater buffer and protection to investments already made by the State of Minnesota. To this end, the DNR may collaborate with Green Corridor, Inc., the Minnesota Board of Soil and Water Resources (BWSR) which administers the RIM program through its local Soil and Water Conservation Districts, or other conservation partners in procuring these easements.

Strategy 2: Restoration and Management

Restoration and resource management – as a means of improving the size, condition and landscape context of habitat within and adjacent to the WMA – might be pursued on both state and private lands. Portions of the WMA (northwest and southeast corners, and centrally) are of relatively low natural resource quality. Restoration of these areas to their historic condition would greatly improve the overall viability of natural resources of the WMA by reducing edge effect, buffering existing high quality lands and creating more contiguous habitat for wildlife species. Finally, the DNR might review its existing management plan to ensure that existing management practices within the WMA are in line with the long-term maintenance of the WMA's exceptional natural resources.

Similarly, restoration of privately owned lands adjacent to the WMA could be pursued by the DNR through collaboration with county NRCS or SWCD offices, tapping a broad suite of state and federal cost share assistance programs for these explicit purposes. Collaboration with BWSR could also bring resources toward restoring and managing the state-held RIM easement located along the northwest corner of the WMA. These actions, again, would serve to buffer the existing WMA and offer greater level of protection to the state's conservation investments. It should be noted that these state and federal cost share assistance programs do not offer perpetual protection, as programs typically have a lifespan of 10-30 years.

4.1.2 Illustrative Example 2

Key Players:

Minnesota DNR – protects the state's natural heritage by conserving the diversity of natural lands, waters, and fish and wildlife that provide the foundation for Minnesota's recreational and natural resource-based economy.

Redwood SWCD – is a special purpose unit of government that manages and directs conservation programs, such as the state Cost-Share Program and the Reinvest In Minnesota (RIM) Program. Water quality is a primary emphasis of the District.

Overview:

The Minnesota DNR manages a state Scientific and Natural Area (SNA) that protects a significant portion of an area identified for its exceptional natural resource value. SNAs preserve natural features and rare resources of exceptional scientific and educational value in the State of Minnesota. The DNR also manages a WMA – considered to be of relatively low natural resource value – that lies immediately adjacent to the SNA. A stream draining agricultural lands enters the SNA from the south, laden with silt and nutrients, and flooding frequently during rain and snow melt events. The creek is having significant negative impacts both on the SNA and other lands along its course, and water quality within the Minnesota River.

A review of the resource prioritization map relative to existing managed areas (Figure 4.4) finds the following:

- Approximately half of the land designated as being of exceptional conservation value is on private land, and has no formal protection.
- The Minnesota DNR manages a WMA of relatively low natural resource value that lies immediately adjacent to the SNA.

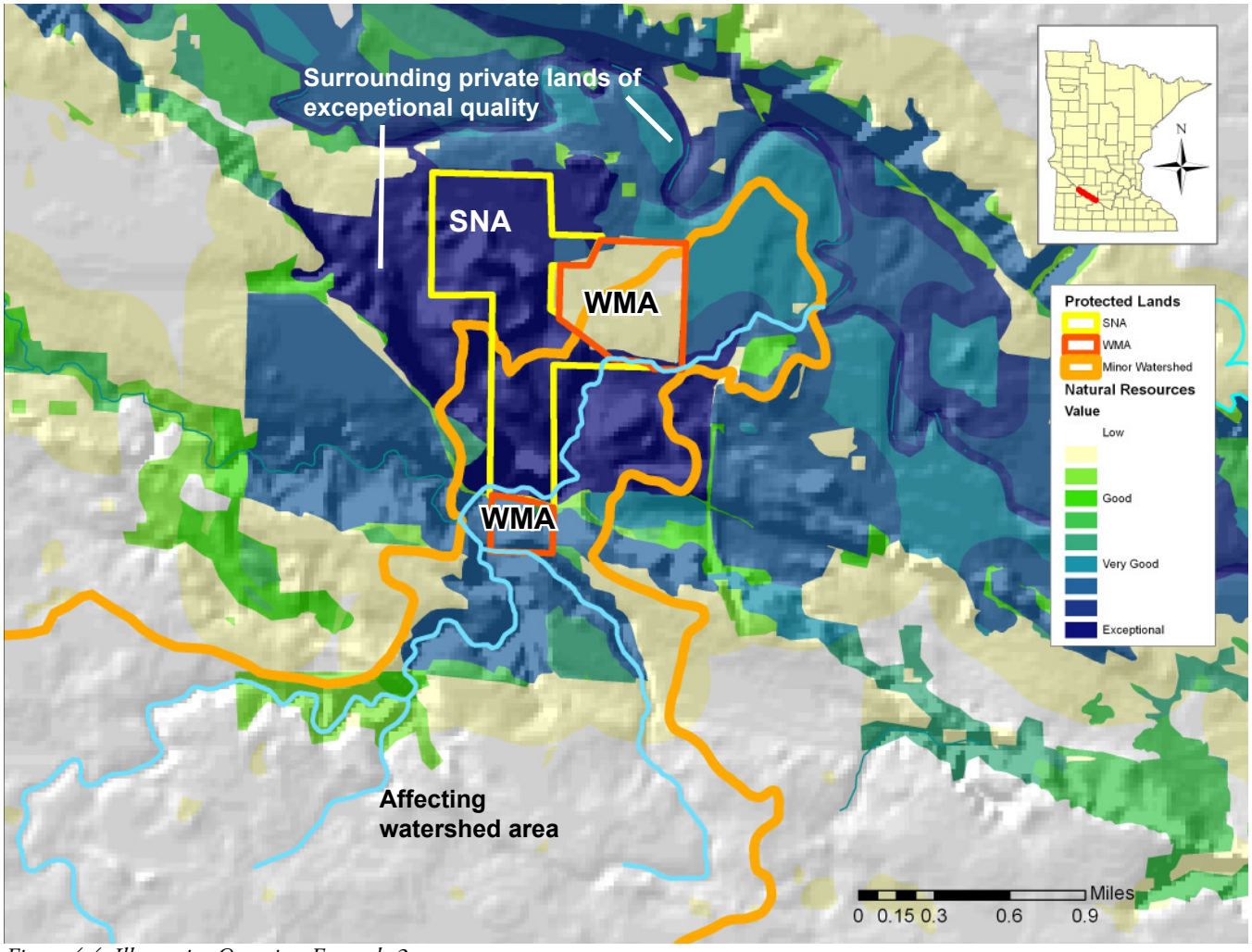

Figure 4.4: Illustrative Overview Example 2

- A number of privately-owned tracts of land enrolled in the Reinvest in Minnesota (RIM) program (a perpetual conservation easement program held by the State of Minnesota) are located immediately adjacent to the SNA and WMA. Most of these are considered to be of very good natural resource value.

Illustrative Strategies

Based on this overview, a number of potential strategies might be employed to enhance conservation of existing state investments and areas of exemplary natural resource value located in the project area. These are described below, but reference Figure 4.5:

Strategy 1: Fee Title and Easement Acquisition

Areas currently in private ownership but of exceptional natural resource value (given their proximity to the existing SNA) are likely candidates for acquisition. Acquisition of these tracts would not only protect the high quality resources of these lands, but also afford greater protection to resources now partially protected within the SNA.

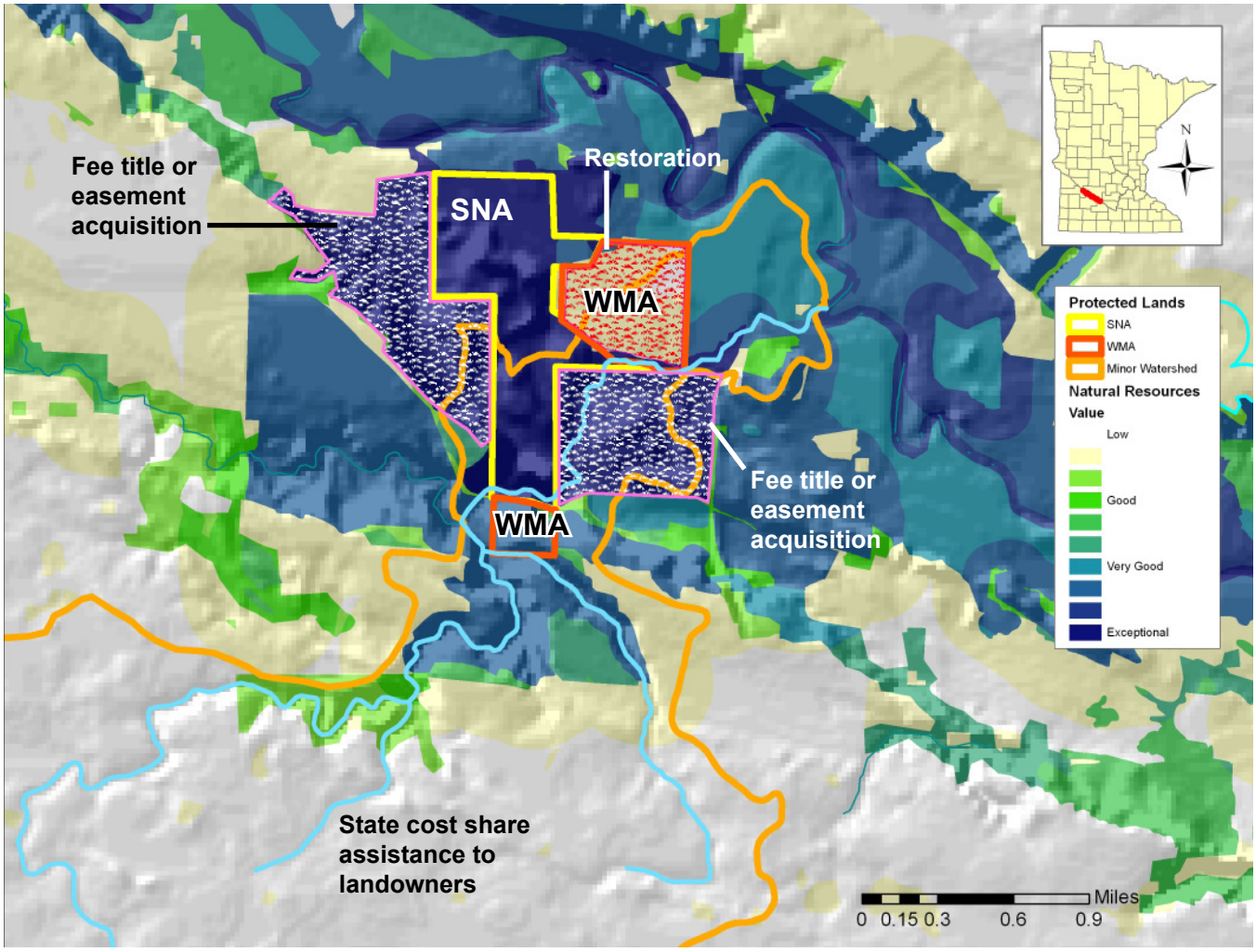

Figure 4.5: Illustrative Strategies Example 2

If landowners are unwilling to sell, the DNR working collaboratively Redwood SWCD using the state's RIM program might pursue long-term conservation easements on these same tracts as a mechanism for affording limited but critical conservation action. In addition, easements might be pursued on other private lands adjacent to or in close proximity to the SNA as a way to offer greater protection to the complex of natural areas.

Strategy 2: Restoration and Management

Restoration and resource management is a key strategy for this site. The WMA, when viewed relative to all other ownership tracts, ranks low and serves to degrade the integrity of the natural resources at the SNA and across the broader complex of private/public lands. Restoration of this WMA to its historic conditions would greatly improve the overall viability of natural resources of this complex of lands, reducing edge effect, buffering existing high quality lands and creating more contiguous habitat for wildlife species. The DNR might review its existing WMA management plan to better complement that of the SNA.

Aside from the WMA, lands in public and private hands within this portion of the Minnesota Valley generally of very good or exceptional natural resource value. Ongoing management of this resource, however, is important and likely to be a challenge to private landowners. Collaboration between MN DNR and Redwood SWCD to effectively target state cost share programs to private landowners in the area would be an important strategy. These actions would serve to buffer the existing SNA and offer greater level of protection to the state's conservation investments. It should be noted that these state and federal cost share assistance programs do not offer perpetual protection, as programs typically have a lifespan of 10-30 years.

Strategy 3: State Cost-Share Assistance to Private Landowners

Improving the quality and hydrology of the stream running through the SNA is a challenge that must be addressed at its source – the agricultural uplands associated with headwaters and mid-stretches of the creek. Reducing these threats will require broad application of strategies that serve to retain water on the landscape, buffer stream courses, protect highly erodible soils, and reduce tillage. To this end, the Redwood SWCD is a logical lead, tapping a variety of state cost share programs. Collaboration with the Redwood County Natural Resources Conservation Service (NRCS) office would broaden this resource base to include federal funds. Finally, as TMDL assessments and implementation plans are finalized, these will open the door to additional funding sources targeting a reduction in phosphorous, nitrogen and other sources of impairment to the Minnesota River.

4.2 Next Steps and Feasibility Assessment

Key strategies to abate major threats and conserve the natural, cultural and historical resources of the Mid-Minnesota Valley are outlined in the discussion of conservation strategies (Section 2.5). In this section, the authors expand upon that discussion, identifying a small suite of priority strategies designed to move the conservation bar significantly forward in the short term. Each of the priorities would require major collaboration and planning to fully develop and implement. And so, at this point, we would not presume to suggest whether or not moving forward on any particular strategy is feasible.

We offer here only the outlines of how such a process might begin. Integral to that discussion is:

1. A review of organizational capacity within partner organizations at the local and state levels to make progress in each respective area,
2. An outline of concrete next steps to make demonstrable progress, and
3. Identification of who is best poised to lead those efforts and otherwise participate.

It is acknowledged here that conservation in this or any other region is a moving target. Circumstances on the ground regularly change as landowners sell property, as the natural and cultural/historical resource base changes, as new laws and regulations are passed, as new conservation programs and funding sources become available, and as conservation organizations and their roles grow or morph over time. Although the authors put forth a suite of priority conservation strategies for the region, an intentional effort is made to ensure that the plan is not overly prescriptive on that front.

4.2.1 Historical/Cultural Resources

The conservation plan for historical and cultural resources as pursued through this planning effort failed to materialize to the extent that was achieved for natural resources. The principle reason for this was due to a lack of robust information from which to draw in developing the plan. As such, the key next steps are targeted squarely at pulling together the base information and developing a robust plan to guide historical and cultural conservation efforts.

Strategy 1. Conduct a comprehensive inventory of the cultural/historical resources.

A solid base of data is critical to the development of a conservation plan that subsequently supports and drives conservation of target resources. As such, a first priority is a comprehensive inventory of the cultural/historical resources of the Middle Minnesota River Valley, tied to the focal themes identified earlier in this plan.

Key Players:

- Local Organization Leader – There exists a number of individuals with deep knowledge of the history of this portion of the Minnesota Valley, but we were unable to effectively tap that knowledge. A locally led planning process will likely have better success in engaging these individuals. Tatanka Bluffs Corridor, Green Corridor, Inc. and the local county historical societies could play this role effectively.

- Support of Statewide Organizations/Agencies – Capacity and expertise in procuring resources to fund the inventory and planning process may be insufficient at the local level. Collaboration with Minnesota Historical Society, James Ford Bell Museum of Natural History, Great River Greening, and other organizations can greatly facilitate this process.
- Technical Expert – Inventory and compilation of historical and cultural features around which the conservation plan will be built must engage an individual or organization with deep knowledge and abilities in these areas.

Strategy 2. Complete the Conservation Plan for Historical and Cultural Resources

Completion of the conservation plan is a critical follow-on step to the inventory of resources within the project area. The authors recommend a process similar to that conducted for natural resources, in that a spatial prioritization of features – around each individual theme, but also across all themes – is a principle outcome. When completed, the historical/cultural planning priorities could be overlaid with those from the natural resources plan to identify areas of overlap and complementary conservation strategies.

Key Players:

- Local Organization Leader – Again, as above, this process must be owned and supported locally. In order to be effectively implemented, the conservation plan must be derived with the full support and buy-in of all key stakeholders in the area. Tatanka Bluffs Corridor, Green Corridor, Inc. or the newly organized Minnesota Valley History Learning Center could play this role.
- Conservation Planner – Building the conservation plan requires an individual with a strong skill set in conservation planning to deliver a product(s) that informs and meets the needs of the conservation community. Great River Greening or another organization employing individuals with this skill set could play this role effectively.

Strategy 3. Identification, Development and Implementation of Priority Strategies

Conservation strategies for historical/cultural resources will become more detailed and complex once the conservation plan is completed. However, those with an interest in the conservation of these resources should begin to assemble and discuss how a robust historical/cultural conservation strategy might be employed in the Middle Minnesota Valley. Relative to the arena of natural resource conservation, few effective non-profit organizations and government agencies have historical/cultural resource conservation as their mission. In many ways, this is indicative of the support and funding base available for this work. A strong, effective organization supported by a broad complement of partner organizations and borrowing from the successful strategies of natural resource organizations can achieve success in this arena.

Key Players:

- Local Organization Leader – Likely the same organization leading the planning process is the one that leads its implementation. Regardless of the organization, it must be savvy, talented, driven, and ultimately well-funded. As before, Tatanka Bluffs Corridor, Green Corridor, Inc. or Minnesota Valley History Learning Center could play this role across the planning area. At individual sites, groups like Wood Lake Battlefield Association, Minnesota Historical Society, Friends of Upper Sioux Agency State Park, Friends of Fort Ridgely State Park or Minnesota DNR can play leadership roles. Local historical societies can play significant roles within respective counties.
- Support of Broad Spectrum of Local, State and Federal Organizations and Agencies – Success on this front can only occur with the broad backing and support of individuals and organizations at the local level, coupled with that of those from outside the Valley. Collaboration with Minnesota Historical Society, James Ford Bell Museum of Natural History, National Park Service, and many other individuals and organizations can greatly this process.

4.2.2 Natural Resources

The conservation plan for natural resources identified geographic priorities in addition to a slate of important key strategies to achieve conservation success in the Middle Minnesota Valley. Although each of these identified strategies plays a role in the ultimate success of conservation efforts in the Valley, the authors have identified a small number that are timely, have capacity in place for implementation, and can have significant impact across the project area.

Strategy 1. Acquisition (Fee Title and Easement)

Acquisition is a common and important strategy for both protecting and providing public access to natural resources. There are a significant number of conservation organizations and state and federal agencies conducting this work, and funding for acquisition is at an unprecedented level as a result of the Outdoor Heritage Fund. The natural resources conservation plan should serve as a primary resource for determining priorities among this collective group of practitioners. Coordination between these organizations will be a key requirement to ensure effective conservation.

Key Players:

- Local/Regional Coordinator – With the array of players and the amount of funding on the table, coordination among these players is a major need. Although many conservation organizations could play this role, Green Corridor, Inc. or the Minnesota DNR's Southern Region are perhaps best suited for this role.
- Implementers – A slate of conservation organizations with expertise in acquisition (fee title and easements) are required to achieve significant conservation gains. Although each has their own specific mission, these overlap between organizations in significant ways. Key acquisition implementers likely include: Green Corridor, Inc., Pheasants Forever, Minnesota DNR, BWSR, USFWS and others.

Strategy 2. Agriculture-Based Strategies

The Middle Minnesota Valley sits amidst a broad, highly productive agricultural region. Although being the region's principle economic engine, agriculture has been a major source of many of the threats to the health and abundance of the Valley's natural resources. Since agricultural lands are largely in private hands, organizations and agencies with a mission of working with these individuals are likely to play primary roles in implementing strategies related to agriculture. Two key agricultural-based strategies are discussed here:

Cost-Share Incentive Programs to Private Landowners – Federal Farm Bill and State Cost Share programs are the principle vehicles through which conservation practices are implemented on private lands in the Minnesota Valley. These programs are numerous and varied, and include Conservation Stewardship Program (CSP), Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP) and others at the federal level, and a host of programs at the state level. Effectively targeting and utilizing these programs can achieve significant impact at the local and broader regional scales.

Key Players:

- County NRCS and SWCD Offices – Federal and state cost-share programs to agricultural land owners are delivered out of respective county NRCS and SWCD offices. As such, these programs are key to the success of this strategy in the Middle Minnesota Valley. Redwood and Renville NRCS and SWCD offices are the key players in this geography.
- Conservation Organizations and Agencies – Conservation organizations and state and federal land management agencies can play a lead role in collaborating with county NRCS and SWCD offices to effectively target delivery of funding to private landowners to achieve maximum conservation benefit in line with the conservation plan. In addition, non-profit conservation organizations can work effectively to shape conservation programs at the state and federal levels and lobby for sufficient funding for implementation of these programs on the ground.

Biofuels Demonstration, Testing, and Feasibility Assessments – As the countries of the World look for new energy sources, biofuels are emerging as competitors with food for available farmland. This tension can lead to intensification of agricultural practices, but can also – if proven to be economically viable – place perennial vegetation on the land, thereby reducing runoff and siltation of streams and serving as a conservation tool. The impact on natural resources stemming from biofuel production is likely to be one of the major issues of concern and focus of research by conservation organizations, state land management agencies, and universities over the coming decades. The Middle Minnesota Valley can serve as a venue for a world-class demonstration site for biofuel production.

Key Players:

- County NRCS and SWCD Offices – These two agencies are the primary deliverers of federal and state conservation programs to private landowners, particularly farmers. Minnesota's Board of Soil and Water Resources (BWSR) delivers State Cost Share Programs to county SWCD offices. Engagement of these agencies will be key in working effectively with private landowners through any related project.

- Research Facilities – Colleges and universities across the state, including University of Minnesota Extension, are conducting ongoing research on all facets of biofuel production and their potential impacts on the environment. The University of Minnesota, including its Southwest Research and Outreach Center in Lamberton, will be key players on the research side of the equation.
- Conservation Organizations and State/Federal Agencies – Groups such as The Nature Conservancy, Minnesota DNR and others are working to test the feasibility of conservation-friendly biofuel production (cellulosic ethanol, biomass) as a conservation strategy.
- Strategy Leader – Strategy development, coordination and fundraising to secure resources to float this concept will require a seasoned program manager housed in one of the partner agencies/organizations. ,

Strategy 3. Strategies to Combat Invasive Species and Enhance Ecosystem Health

Ecosystem health underpins the ability of the native flora and fauna of the Middle Minnesota Valley to persist over time. As such, it is critical that the remaining natural areas of the region be managed effectively to control invasive species and enhance the health of these declining ecosystems. Two key strategies are identified here:

Private Lands Management - Invasive native and exotic species increasingly are posing major threats to remaining natural ecological systems. Awareness of and actions to abate these threats, however, have not been adequate to stem their impact. Education, awareness and incentives to landowners (cost-share funding) are key components of a strategy to better control these species on privately-held lands. In the project area, county NRCS and SWCD offices are the principle vehicles through which private cost-share funding is delivered. For a detailed description of this strategy, see Strategy 2 (Agriculture-Based Strategies) above.

Public Lands Management – A state legislative audit of the DNR in 2010 identified that the agency did not have the resources to adequately manage the lands that it owned. This audit effectively elevated, in the eyes of the conservation community and legislators alike, the need for greater resource management and restoration of our treasured public lands. Similarly, inadequate management of state interests on private lands (easements) was also flagged. This is a key second strategy related to invasive species control and restoration of ecosystem health in the Middle Minnesota Valley.

Key Players:

- Public Land Management Agencies – Government agencies such as the DNR and US Fish and Wildlife Service are tasked with managing the natural resources in the state and nation, respectively. Effective management and protection of these investments is a critical need in the Valley.
- Public and Non-Profit Easement Holders – The State of Minnesota (via DNR and BWSR) and various non-profit conservation organizations hold conservation easements on private lands. Effective management and protection of these investments is a critical need in the Valley.
- Non-Profit Conservation Organizations – Non-profit conservation organizations can assist state and federal agencies with management and restoration needs on publicly held lands, and can assist in elevating the resource stream to these activities through fundraising, grant writing and other means. Key players in this arena include Great River Greening, Pheasants Forever, Ducks Unlimited, and others.

Strategy 4. Strategies to Address Water Quality Impairments in Streams and Rivers

The Minnesota River has long been known for the poor quality of its waters. Excessive sedimentation and nutrients within the waters have led to a near complete loss of native freshwater mussel populations and degradation in many other associated species. In addition, the river has been flagged as one of the largest contributors to the dead zone within the Mississippi Delta region of the Gulf of Mexico. Two strategies to address this issue are identified below:

Lake Pepin TMDL – Strategies designed to enhance the Minnesota River and its tributaries should be identified through a basin-wide assessment and planning process, and as such, recommendations put forth here are merely preliminary to such an undertaking. Fortunately, such an undertaking is now underway associated with the Lake Pepin TMDL (Total Maximum Daily Load) assessment, which will include the entire stretches of the Minnesota, St. Croix, and upstream portions of the Mississippi rivers. Implementation strategies will ultimately flow from that assessment. Recommended strategies will likely include (among others) practices to: 1) reduce runoff and keep water on the land, 2) reduce stream bank erosion, 3) increase permanent vegetation in key areas (along stream corridors, etc.), and so forth.

Key Players:

- Minnesota Pollution Control Agency (MPCA) – The MPCA works with Minnesotans to protect, conserve and improve our environment and enhance our quality of life and is the lead agency for conducting TMDL assessment and for developing subsequent implementation plans in collaboration with local agencies and organizations.
- Implementation Partners – An array of government agencies and organizations will be tasked with identifying implementation strategies to achieve the TMDL recommendations stipulated in the Lake Pepin TMDL assessment. Key implementation partners will likely include: Renville and Redwood SWCD and NRCS offices, Minnesota DNR, BWSR, and others.

Conservation Practices with Economic Incentives – Several promising initiatives are underway or proposed that could be applied within the Middle Minnesota Valley that serve to create economic incentives for installing or managing permanent vegetation. These include: 1) working lands for biofuels, 2) allowing for mid-term grazing of CRP lands within the federal Farm Bill, and 3) grazing WMAs following prescribed fire. Each serves to mimic natural processes under which native grasslands evolved, yet provide an economic incentive to farmers and ranchers.

Key Players:

- Minnesota DNR – The Minnesota DNR is currently exploring a working lands model on WMAs in southwest Minnesota that provides a test case for what might be achievable in the Middle Minnesota Valley on both WMAs and Aquatic Management Areas (AMAs).

- Conservation Organization Partners – Groups such as The Nature Conservancy TNC), Minnesota DNR and others are working to explore and test the feasibility of these conservation strategies in other geographies of the state. Their expertise and knowledge could be brought to bear in the Middle Minnesota Valley. In addition, key non-profit conservation organizations like TNC could lobby for modification of existing Farm Bill regulations to allow for mid-term CRP grazing.

Strategy 5. Recreation as a Conservation Strategy

The Minnesota River has significant potential for development of recreational assets that could serve to drive conservation along its corridor. Trail construction (biking, hiking, horse, canoe, birding, etc.) is a hot topic of discussion, with planning and trail development well underway. This strategy, relative to all others, has caught the eye of local units of government and has served to garner a broad base of participation from conventional and non-conventional partners alike.

Key Players:

- Local Organization Leader – A local leader is absolutely key to the development and implementation of diverse recreation plan that underpins both the conservation and economic interests of the Minnesota Valley. Tatanka Bluffs Corridor is currently playing that role, with broad participation by local, state and federal units of government, conservation organizations, recreational user groups and individuals.
- Trail Planner – Trails, in many ways, underpin the recreational aspects of the strategy. To that end, an experienced trail designer is needed to design trails that link both recreational and natural resources. The University of Minnesota's Center for Changing Landscapes is currently developing a master trail design for the project area.
- Implementation Leader(s) and Partners – Once designs/plans are put to paper, experienced implementation partners are needed to make them become a reality. Given the diversity of interests advocating for trails in the project area, a broad base of support is already available. Leadership and coordination of these interest groups to pull together funding proposals, gain political clout, and so forth, is a key requirement; Tatanka Bluffs Corridor is playing this key role, in collaboration with Renville and Redwood Counties, Green Corridor, Inc., Renville County Parks Commission, Minnesota Trail Riders Association, National Park Service Rivers & Trails Program, Friends of the Casey Jones Trail, Minnesota Valley Sno-Riders Snowmobile Club, Upper Minnesota Valley Trail Riders Association and the DNR Parks & Trails Division.

4.2.3 Over-Arching Strategies

Significant progress and success within both natural and cultural/historical components of the plan will require strong, broad collaboration among a diverse array of partners and stakeholders along with a continued funding stream necessary to achieve the conservation vision. To this end, we identify a final keystone strategy.

Strategy 1. Keystone Strategy for Landscape Reconciliation Success:

Development of and continued support by a strong collaboration of local, regional, state and national partners in funding and implementing a shared conservation and recreation vision is paramount to the success of this venture. This vision calls for a reconciliation of the fragmented landscape to conserve (over the long term) the unique ecological, cultural and historical resources of the Middle Minnesota Valley. As this collaborative partnership succeeds, the Valley will not only become a Minnesota conservation legacy, but also a national recreational and educational destination.

Key Players:

- Local Organization Leader – A local leader is central to the successful implementation of this conservation vision for the Middle Minnesota Valley. The Tatanka Bluffs Corridor and the Green Corridor are currently sharing that role, with broad participation by local, state and federal units of government, conservation organizations, recreational user groups and individuals.
- Supportive Community Stakeholders and Willing Landowners – Community stakeholders who understand the conservation vision and resulting economic vitality and, who are willing to lead in developing this legacy, and willing landowners that will offer their properties to be part of this land legacy are crucial to the success of this program.
- Local, Regional, State and National Partners – A broad coalition of partners who are willing to share the landscape to make the vision happen on the ground is required to make this vision a reality.
- Funders – Implementation of this vision cannot happen without continued support of funders at the individual, local, state, regional and national levels.

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- Redwood County SWCD
- Renville County SWCD
- Redwood Area Development Corporation
- Renville County Housing & Economic Development Authority
- City of Redwood Falls
- Minnesota Valley Regional Rail Authority
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- Minnesota River Valley National Scenic Byway Alliance
- Minnesota River Watershed Alliance
- National Park Service – Rivers Program
- Minnesota Trail Riders Association
- Upper Minnesota Trail Riders Association
- Redwood Valley Riders Saddle Club
- Renville County Amigo Riders Saddle Club
- Redwood Falls Sportsmen's Club
- Morgan Sportsmen's Club
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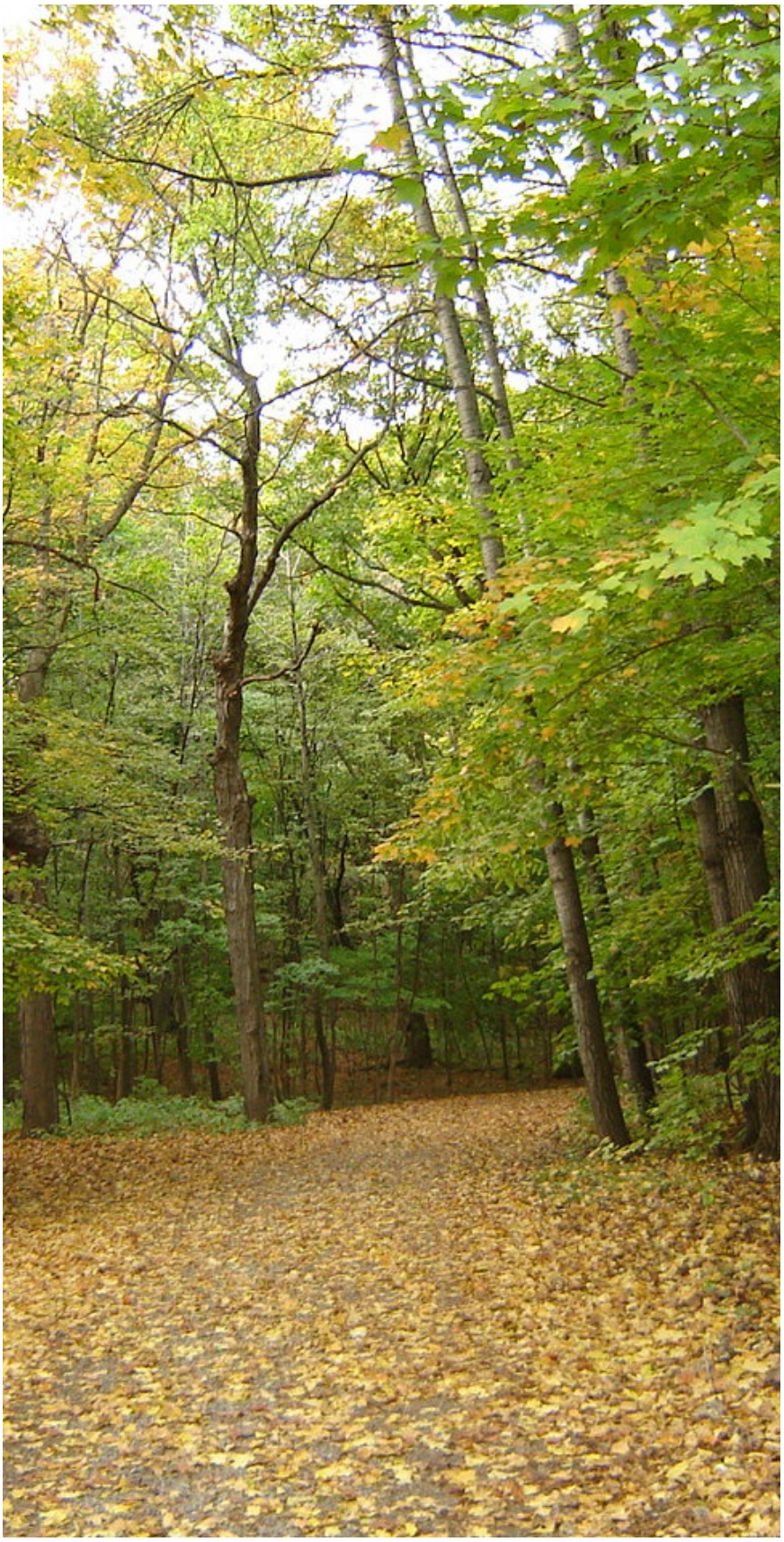

Appendices

Appendix A: Building a foundation for Conservation Design

Appendix B: Documented Rare Flora & Fauna

Appendix C: Documented Natural Communities

Appendix D: Threats & Strategies

Appendix E: Historical/Cultural Sites

Figure A.1: Fall in the Minnesota River Valley
©Brad Cobb

Appendix A: Building a Foundation for Conservation Design

Prior to entering into conservation planning for the Middle Minnesota Valley, a group of individuals representing key stakeholders met to discuss the scope, direction, team structure, timeline and budget for the planning exercise. This meeting – held on August 28, 2008 at Fort Ridgely State Park – cemented a close working relationship between the newly established Steering Committee, Core Team, and Assessment and Design Team. A brief summary of the process developed for developing the conservation plan is provided below.

Planning Leads, Committees and Teams

As detailed in Figure A.1 (Team Structure Diagram), there are several key responsibilities related to both development of a conservation plan and its subsequent implementation. Individuals, teams, or committees assigned these roles are integral to the overall compilation and implementation of the conservation plan. These parties and their respective roles are as follows:

Minnesota River Valley Green Corridor: Long Term Conservation Plan

Team Structure Diagram

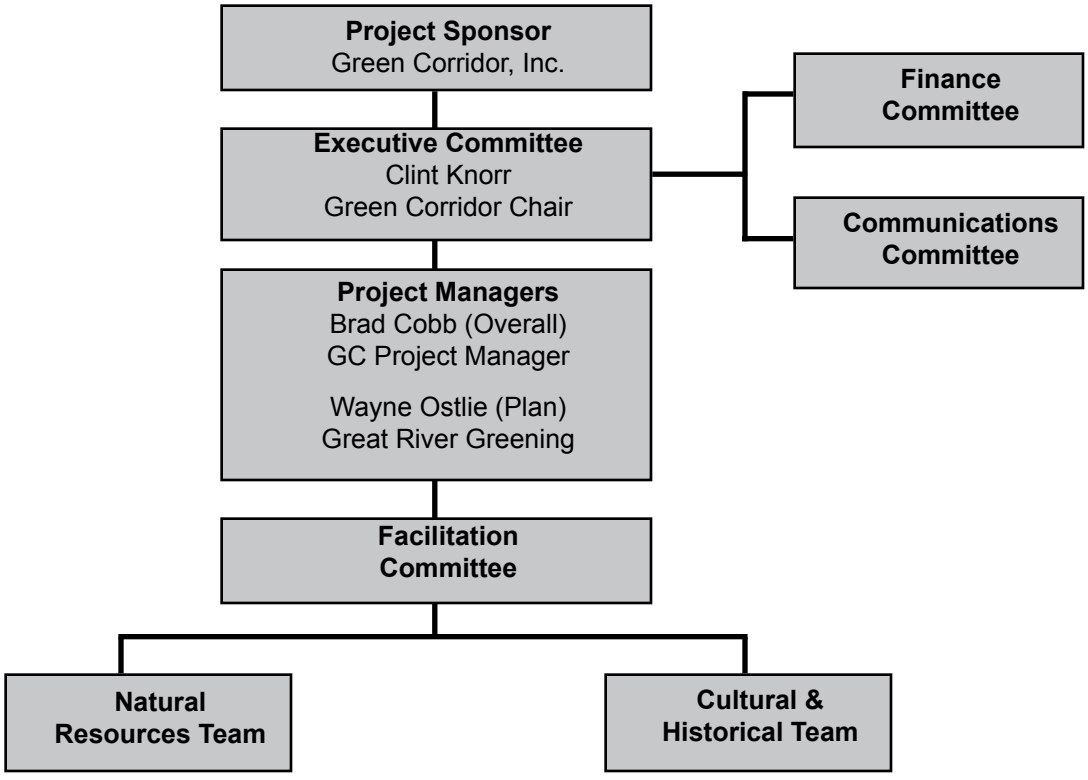

Figure A.1: Team Structure Diagram

1. Project Sponsor: Green Corridor, Inc., the Project Sponsor acts as a vocal and visible champion, legitimizes the project's goals and objectives, keeps abreast of major project activities, and is a decision-maker for the project. The Project Sponsor provides support for the Project Manager; assists with major issues, problems, and policy conflicts; removes obstacles; is active in planning the scope; approves scope changes; signs off on major deliverables; and signs off on approvals to proceed to each succeeding project phase. The Project Sponsor generally chairs the steering committee on large projects.

2. Project Manager: The Project Manager is responsible for ensuring that the project is completed on time, within scope and on budget. S/He develops the Project Plan with the team and manages the team's performance of project tasks. It is also his/her responsibility to secure acceptance and approval of deliverables from the Project Sponsor and Stakeholders. The project manager for the conservation plan is Wayne Ostlie, Great River Greening; the overall project manager is Brad Cobb, projects manager for the Green Corridor.

3. Executive Committee: Led by Clint Knorr and composed of the Green Corridor, Inc.'s Board of Directors, the Executive Committee approves the work plan, reviews and approves the conservation plan, and oversees the implementation of the conservation plan going forward.

4. Communications Committee: Represented by members of the Green Corridor Board of Directors and others, the committee develops and implements a communication strategy on behalf of the Green Corridor. This committee is integral to the development of the Middle Minnesota Conservation Plan, identifying target audiences and ensuring that information related to the planning effort meshes with the direction of the organization.

5. Finance Committee: Represented by members of the Green Corridor Board of Directors, the committee approves all financial requests (donations and grants) to cover all acquisition, administrative and other organizational costs.

4. Facilitation Committee: The Facilitation Committee is led by the Project Manager and develops/executes the project plan in hand with the designated work teams. The Committee staffs and provides direction to the work teams to facilitate the completion of the project plan.

5. Work Teams: The Work Teams are responsible for executing tasks and producing deliverables as outlined in the Project Plan and directed by the Project Manager and Facilitation Committee. Two work teams were formed: – a Natural Resources Team and a Cultural/Historical Team – to assist with the development of those components of the plan.

The Planning Process

The planning process adopted for use for the Middle Minnesota Valley was comparable to that followed by numerous other planning teams across the country and globe, and therefore will not be described in detail here. Figures A.2 and A.3 illustrate the major phases of the project, the approximate timeframe for each, and the relationship and responsibilities of the teams in developing the plan.

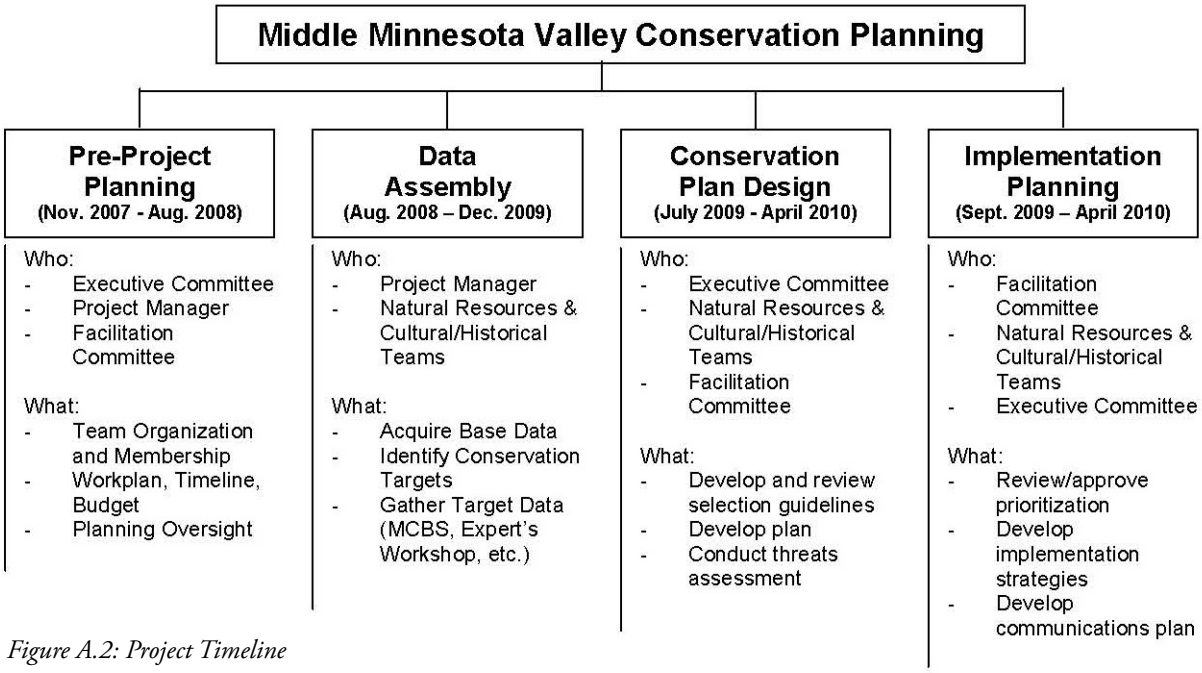

Figure A.2: Project Timeline

Minnesota River Valley Green Corridor: Long Term Conservation Plan

Detailed Planning Process

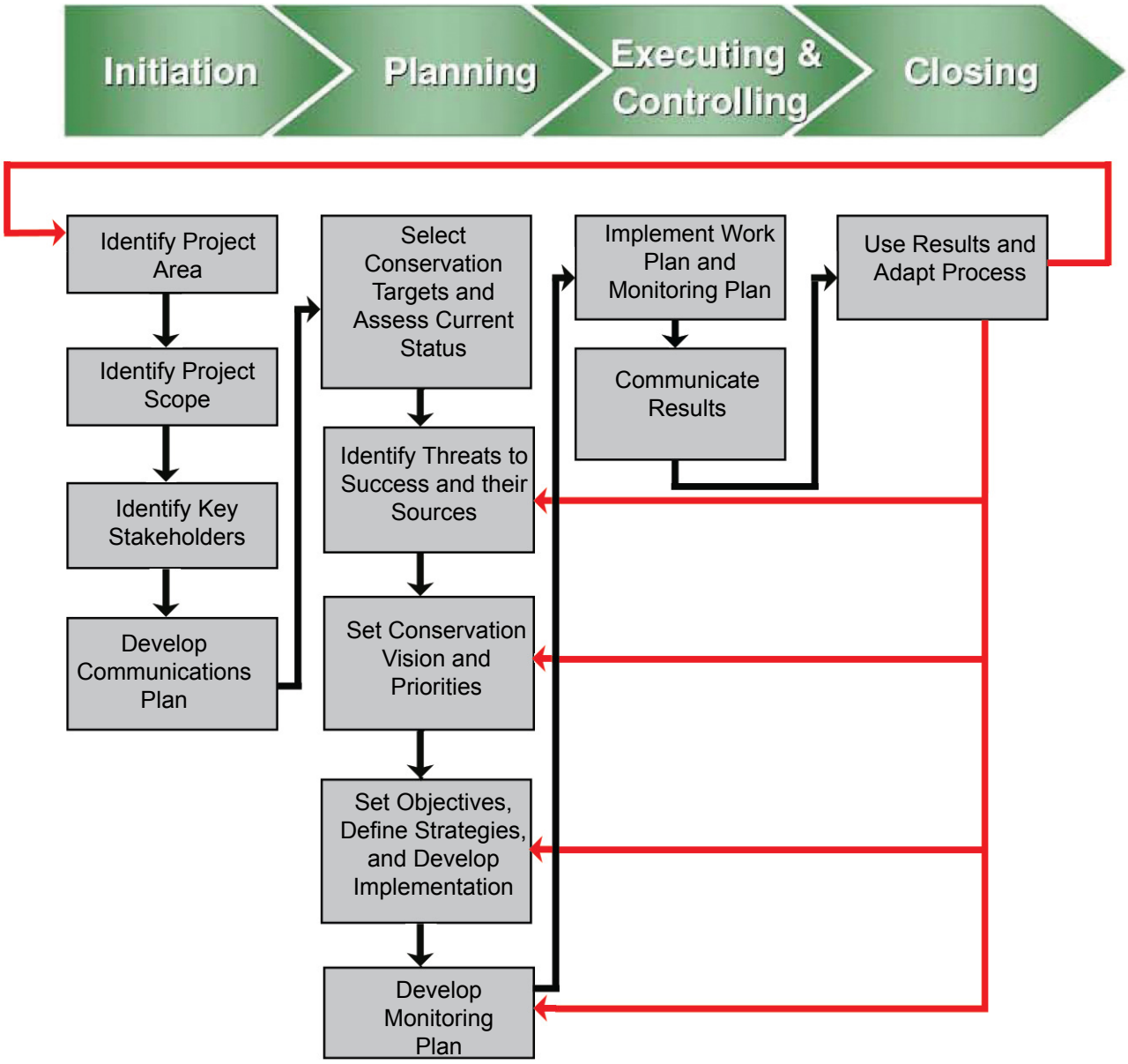

Figure A.3: Detailed Planning Process

Appendix B: Documented Rare Flora & Fauna (Minnesota Heritage Data Base)

Scientific Name	Common Name	Federal Status	State Status
Birds			
Bartramia longicauda	Upland Sandpiper		Tracked in heritage database
Botaurus lentiginosus	American Bittern		Tracked in heritage database
Buteo lineatus	Red-shouldered Hawk		Special Concern
Dendroica cerulea	Cerulean Warbler		Special Concern
Haliaeetus leucocephalus	Bald Eagle		Special Concern
Fish			
Cycleptus elongatus	Blue Sucker		Special Concern
Ictiobus niger	Black Buffalo		Special Concern
Polyodon spathula	Paddlefish		Threatened
Insects			
Atrytone arogos	Arogos Skipper		Special Concern
Hesperia ottoe	Ottoe Skipper		Threatened
Speyeria idalia	Regal Fritillary		Special Concern
Lichens			
Buellia nigra	A Species of Lichen		Endangered

Ictiobus niger, Black Buffalo
© K. Schmidt, MNDNR

Scientific Name	Common Name	Federal Status	State Status
Mammals			
Reithrodontomys megalotis	Western Harvest Mouse		Tracked in heritage database
Mussels			
Actinonaias ligamentina	Mucket		Threatened
Alasmidonta marginata	Elktoe		Threatened
Arcidens confragosus	Rock Pocketbook		Endangered
Elliptio dilatata	Spike		Special Concern
Lampsilis teres	Yellow Sandshell		Endangered
Lasmigona compressa	Creek Heelsplitter		Special Concern
Lasmigona costata	Fluted-shell		Special Concern
Ligumia recta	Black Sandshell		Special Concern
Obovaria olivaria	Hickorynut		Special Concern
Pleurobema coccineum	Round Pigtoe		Threatened
Quadrula metanevra	Monkeyface		Threatened
Quadrula nodulata	Wartyback		Endangered
Tritogonia verrucosa	Pistolgrip		Threatened
Venustaconcha ellipsiformis	Ellipse		Threatened
Reptiles			
Apalone mutica	Smooth Softshell		Special Concern
Elaphe vulpina	Eastern Fox Snake		Tracked in heritage database
Eumeces fasciatus	Five-lined Skink		Special Concern

Five-lined Skink
© T.Jessen, MNDNR

Scientific Name	Common Name	Federal Status	State Status
Reptiles (continued)			
Heterodon nasicus	Western Hognose Snake		Special Concern
Pituophis catenifer	Gopher Snake		Special Concern
Plants			
Alopecurus carolinianus	Carolina Foxtail		Tracked in heritage database
Aristida purpurea var. longiseta	Red Three-awn		Special Concern
Asclepias sullivantii	Sullivant's Milkweed		Special Concern
Astragalus lotiflorus	Low Milk-vetch		Tracked in heritage database
Astragalus missouriensis	Missouri Milk-vetch		Special Concern
Bacopa rotundifolia	Water-hyssop		Special Concern
Besseya bullii	Kitten-tails		Threatened
Carex annectens	Yellow-fruited Sedge		Special Concern
Cerastium brachypodum	Mouse-ear Chickweed		Tracked in heritage database
Cladium mariscoides	Twig-rush		Special Concern
Cyperus acuminatus	Short-pointed Umbrella-sedge		Threatened
Cypripedium candidum	Small White Lady's-slipper		Special Concern
Elatine triandra	Three Stamened Waterwort		Tracked in heritage database
Eleocharis quinqueflora	Few-flowered Spike-rush		Threatened
Eleocharis wolfii	Wolf's Spike-rush		Endangered
Fimbristylis puberula var. interior	Hairy Fimbristylis		Endangered
Gleditsia triacanthos	Honeylocust		Tracked in heritage database
Gymnocladus dioica	Kentucky Coffee-tree		Tracked in heritage database
Hordeum pusillum	Little Barley		Tracked in heritage database
Lespedeza leptostachya	Prairie Bush Clover	Threatened	Threatened
Monolepis nuttalliana	Povertyweed		Tracked in heritage database
Myosotis verna	Forget-me-not		Tracked in heritage database
Myosurus minimus	Mousetail		Tracked in heritage database
Opuntia macrorhiza	Plains Prickly Pear		Special Concern
Orobanche fasciculata	Clustered Broomrape		Special Concern
Panax quinquefolius	American Ginseng		Special Concern
Rhynchospora capillacea	Hair-like Beak-rush		Threatened
Schedonnardus paniculatus	Tumblegrass		Special Concern
Scleria verticillata	Whorled Nut-rush		Threatened
Triglochin palustris	Marsh Arrow-grass		Tracked in heritage database

Appendix C: Documented Native Ecological Systems

Prairie Types

Southern Dry Prairie (UPs13)

"Grass-dominated herbaceous communities on level to steeply sloping sites with droughty soils. Moderate growing-season moisture deficits occur most years, and severe moisture deficits are frequent, especially during periodic regional droughts. Historically, fires probably occurred every few years" (MNDNR 2005).

Documented subtypes: Dry Sand-Gravel Prairie (Southern), Dry Hill Prairie (Southern)

Southern Dry Savanna (UPs14)

"Sparsely treed communities with grass-dominated herbaceous ground layers on nearly level to steeply sloping sites with droughty soils. Moderate growing-season moisture deficits occur during most years, and severe moisture deficits are frequent, especially during periodic regional droughts. Trees are open grown, typically small and gnarled" (MNDNR 2005).

Documented subtypes: Dry Hill Oak Savanna (Southern)

Southern Mesic Prairie (UPs23)

"Grass-dominated but forb-rich herbaceous communities of somewhat poorly drained to well-drained loam soils mainly formed in unsorted glacial till, sometimes in a thin loess layer over till, and locally in lacustrine sediments and outwash deposits. Communities in this class occur primarily on level to gently rolling sites. Drought stress is irregular in occurrence and usually not severe"
(MNDNR 2005).

Documented subtype: Mesic Prairie (Southern)

Southern Wet Prairie (WPs54)

"Grass-dominated but forb-rich herbaceous communities on poorly drained to very poorly drained loam soils formed in lacustrine sediments, unsorted glacial till, or less frequently outwash deposits. Typically in slight depressions, sometimes on very gentle slopes. Flooded for brief periods at most; upper part of rooting zone is not saturated for most of growing season, but saturation usually persists in lower zone for much of season"
(MNDNR 2005).

Documented subtype: Wet Prairie (Southern)

Forest Types

Southern Dry-Mesic Oak (Maple) Woodland (FDs37)

"Dry-mesic hardwood forests on undulating sand flats, hummocky moraines, and river bluffs. Present mostly on fine sand or sand-gravel soils. Often on south- or west-facing slopes but common also on flat to undulating sandy lake plains. Historically, fires were common in this community, and many stands are on sites occupied by brushlands 100 years ago." (MNDNR 2005)

Documented subtype: Pin Oak - Bur Oak Woodland

Southern Floodplain Forest (FFs68)

"Wet-mesic deciduous forests on silty or sandy alluvium on level, occasionally flooded sites along small streams to large rivers in the southern half of Minnesota" (MNDNR 2005).

Documented subtype: Silver Maple - (Virginia Creeper) Floodplain Forest

Southern Mesic Oak-Basswood Forest (MHs38)

"Mesic hardwood or, occasionally, hardwood-conifer forests. Present on wind-deposited silt on bedrock bluffs, on calcareous till on rolling till plains, and, rarely, on weakly calcareous till on stagnation moraines." (MNDNR 2005).

Documented subtypes: Basswood - Bur Oak (Green Ash) Forest, Red Oak - Sugar Maple - Basswood - (Bitternut Hickory) Forest

Southern Mesic Maple-Basswood Forest (MHs39)

"Rich Mesic hardwood forests on loamy soils derived from calcareous till or wind-deposited silt over bedrock. Present on sites that have been historically protected from fires on hummocky stagnation moraines, on till plains along the Minnesota River, and on middle or lower slopes of bedrock bluffs." (MNDNR 2005).

Documented subtype: Sugar Maple - Basswood - (Bitternut Hickory) Forest

Southern Wet-Mesic Hardwood Forest (MHs49)

"Rich, wet-mesic lowland hardwood forests on level silty alluvium in stream valleys and on level glacial till bordering lakes. Sites are protected from fire, and soils remain moist throughout the growing season." (MNDNR 2005).

Documented subtype: Elm - Basswood - Black Ash - (Hackberry) Forest

Rock Outcrop Types

Southern Bedrock Outcrop (ROs12)

"Dry, open lichen-dominated plant communities on areas of exposed bedrock. Woody vegetation is sparse, and vascular plants are restricted to crevices, shallow soil deposits, and rainwater pools." (MNDNR 2005).

Documented subtype: Crystalline Bedrock Outcrop (Prairie) MN River Subtype

Wetland Types

Prairie Bulrush-Arrowhead Marsh (MRp39)

"Emergent marsh communities typically dominated by bulrushes, bur reeds, arrowheads, or spikerushes. Present along lakeshores and stream borders." (MNDNR 2010a).

Documented subtypes: Bulrush Marsh (Prairie), Spikerush - Bur Reed Marsh (Prairie)

Prairie Extremely Rich Fen (OPp93)

"Open graminoid-dominated fens on permanently saturated peat sustained by mineral-rich groundwater discharge, with little influence from surface water inputs. Typically present on sloping sites; peat is sometimes mounded or domed. Small pools and sparsely vegetated marly peat areas are commonly present." (MNDNR 2010a).

Documented subtypes: Calcareous Fen (Southwestern)

Prairie Wet Meadow/Carr (WMp73)

" Open wetlands dominated by a dense cover of graminoids. Present in small, shallow depressions in the western and southern parts of the state." (MNDNR 2005)

Southern Seepage Meadow/Carr (WMs83)

"Open wetlands dominated by a dense cover of hummock-forming broadleaved sedges or tall shrubs. Present in areas of groundwater seepage along streams and drainage ways, on sloping terraces, and at bases of slopes." (MNDNR 2010a).

Appendix D: Threats & Strategies

Natural Resources: Terrestrial

Threats	Source of Threat:	Strategies to Abate Threat
1. Land Use & Land Use Legacies • Habitat Loss, Conversion & Fragmentation	Farm Bill; Economic Interests; Development Interests	1. Stronger Farm Bill Programs for Resource Protection 2. Farm Bill Giving Farmers Good Options 3. Economic Incentives for Conservation through State/Federal Programs 4. Stronger DNR Wild and Scenic River Program 5. Develop Strong Civic Engagement Programs 6. Restoration of Natural Habitats 7. Development of Local Ecotype Seed Sources for Restoration 8. Incentives for Permanent Vegetation; Increase Working Lands (Biofuels, Grazing WMAs behind fire)
2. Invasive Species	Agriculture; Federal/State Farm Programs; Nursery Trade; MN Department of Transportation	1. Curtailment of Invasive Species Plantings through State/Federal Agencies 2. Outreach to Nursery Retailers 3. Stronger Eradication Programs for Established Populations (Public and Private) 4. Develop Strong Civic Engagement Programs
3. Loss/Alteration of Natural Processes • Fire • Grazing	Agricultural Practices; Habitat Conversion; Farm Bill; Societal Norms and Expectations: Smokey the Bear	1. Education/Outreach 2. Demonstration Sites for Fire and Grazing with Livestock 3. CRP Program that Allows for Prescribed Fire followed by Grazing
4. Development & Urbanization	Population Growth; Economic Growth	1. Zoning 2. Easement Acquisition (Wild & Scenic River)
5. Incompatible or Unsustainable Recreational Activities	Conflicting Management Objectives (Public and Private Lands); Lack of Enforcement (Enabler on Public Lands)	1. Outreach and Education (Public and Private Lands) 2. Enforcement (Public Lands)

Threats	Source of Threat:	Strategies to Abate Threat
6. Incompatible Ecosystem Management	Conflicting Management Objectives (Public and Private Lands)	1. Multi-Agency Coordination
7. Mining	Quarry Operations	1. Easement Acquisition 2. Fee Title Acquisition 3. Partnership with Private Landowners
8. Climate Change	Industrial Emmissions; Vehicle Emissions (all carbon/nitrogen sources)	1. Alternative Fuel Sources (Cellulosic, Ethanol) 2. Education and Outreach
9. Aquifer Depletion	Irrigation; Municipal Water Supply; Climate Change; Wetland Drainage; Ethanol Production	1. Strengthen Existing Farm Bill Program 2. Wetland Restoration (via DNR, DU, FWS, etc.) 3. Tighter Ethanol Production Regulations

Natural Resources: Freshwater

1. Invasive Species	Ship Ballast Water Dumping; Aquarium Trade; Recreational Vehicle Transport; Nursery Trade	1. Great Lakes Ballast Dumping Regulations 2. Outreach to Nursery Retailers 3. Stronger Eradication for Established Populations (Public and Private) 4. State Legislation - Noxious Species 5. Develop Strong Civic Engagement Programs
2. Hydrologic Alteration • Surface Drainage & Hydrologic Alteration • Dams & Culverts • Elevation of Magnitude/Duration of Peak Flows • Floodplain Alteration • In-Stream Channelization & Dredging	Minnesota Drainage Law; Agriculture Flood Control Actions; Electrical Generation	1. Change MN Drainage Law 2. Stream/River Channel and Habitat Restoration 3. Enhance Efforts to Keep Water on the Land 4. Lake Pepin TMDL Process 5. “Proof of Concept” Implementation through Small Watersheds 6. Wetland Restoration 7. Removal of Obsolete Dams 8. Incentives for Permanent Vegetation; Increase Working Lands (Biofuels, Grazing WMAs behind fire)

Threats	Source of Threat:	Strategies to Abate Threat
3. Non-Point Source Pollution & Runoff • Nutrient Flow – Land Use Practices • Erosion & Sedimentation – Land Use Practices	Minnesota Drainage Law; Agriculture Agriculture (Row Crop); Wetland Drainage; Tiling	1. Change MN Drainage Law 2. Low/No Till Agriculture 3. Lake Pepin TMDL Process 4. "Proof of Concept" Implementation through Small Watersheds 5. Wetland Restoration 6. Enforce State Laws (Buffer Strips, etc.) 7. Incentives for Permanent Vegetation; Increase Working Lands (Biofuels, Grazing WMAs behind fire)
4. Climate Change	Industrial Emmissions; Vehicle Emissions; All Carbon/Nitrogen Sources	1. Alternative Fuel Sources (Cellulosic, Ethanol) 2. Education and Outreach
5. Point Source Pollution • Mining • Feed Lot Contamination • Septic Systems	Agriculture (Feed Lots); Mining; Industry; Homeowners	1. Enforcement of State Laws - MPCA
6. Aquifer Depletion	Irrigation; Municipal Water Supply; Climate Change; Wetland Drainage: Ethanol Production	1. Strengthen Existing Farm Bill Programs 2. Wetland Restoration (via DNR, DU, FWS, etc.) 3. Tighter Ethanol Production Regulations

Historical/Cultural:

1. Benign Neglect	Lack of appreciation; Lack of awareness; Lack of resources	1. Complete comprehensive inventory and prioritize resource 2. Educate landowners 3. Develop cost-share programs or other funding streams for historical/cultural priorities
2. Development & Urbanization	Population Growth; Economic Growth	1. Conduct urban and land use planning at city and county levels 2. Build historical designations into county zoning 3. Develop incentive programs for preservation of historic/cultural sites

Threats	Source of Threat:	Strategies to Abate Threat
3. Loss of Knowledge/Passing of Time	Inadequate historical documentation	1. Conduct comprehensive inventory of historical/ cultural features 2. Conduct research, literature and oral.
4. Land Use and Land Use Legacies	Land conversion (Agriculture)	See Terrestrial Threats above.
5. Maintenance Deficiency	Lack of financial and human resources	1. Work with state/county governments to mechanisms for long-term maintenance funding. 2. Develop/cultivate local “friends” groups to support sites. 3. Pursue innovative funding strategies that marry continued use with long-term maintenance. 4. Complete comprehensive inventory and prioritize resources 5. Educate landowners 6. Develop cost-share programs or other funding streams for historical/cultural priorities
6. Economic and Social Changes	Changing State Responsibilities; Deterioration of public funding	1. Work with state/county governments to mechanisms for long-term maintenance funding. 2. Develop/cultivate local “friends” groups to support sites.
7. Insufficient and Inadequate Conservation Standards		1. Work with resource professionals, state/county historical societies and government agencies in establishing and maintaining standards.
8. Tourism-Related Degradation and Loss	Insufficient enforcement and education; Inadequate protective measures including capacity controls.	1. Develop and implement standards for tourism use and taylor them to specific sites. 2. Implement site management and maintenance standards at sites. 3. Increase funding for enforcement and education.
9. Lack, Loss or Insufficient Protective Heritage Legislation	Lack of appreciation or support at legislative levels; Lack of support among local constituencies	1. Educate local legislatures 2. Build statewide support for historical resources

Appendix E: Historic/Cultural Site Descriptions

Alexander Ramsey Park (Other - Early Recreation) - Redwood County
"Alexander Ramsey Park is the largest municipal park in Minnesota. The park spans 217 acres with vast features that have something for everyone!

The park was built as a state park in 1911 with much of the work being done by the CCC during the 1930's. The state of Minnesota gave the park back to the city of Redwood Falls in later years and now the city maintains and improves the park." (NSBMRV 2010b)

Ramsey Falls
© Kristi Fernholz

Andrew John Volstead House (Important People) - Yellow Medicine County
"Andrew John Volstead was institutional in the creation of the 18th Amendment. This amendment banned "the manufacture, sale, or distribution of intoxicating liquors." It went into effect July 1, 1920. The Volstead Act — also known as the National Prohibition Act — was enacted in October, 1919 to provide for enforcement mechanisms. It gave federal authorities the power to prosecute violations. Also, it defined intoxicating beverages as those containing more than .5 percent alcohol." (NSBMRV 2010a)

Birch Coulee Battlefield Site (Military) - Renville County
"*The location of one of the hardest fought battles of the U.S.-Dakota War, the Battle of Birch Coulee, was fought here. Visitors can walk a self-guided trail through recreated prairie and read about the battle from the perspectives of Joseph Anderson, a captain in the U.S. Army, and Wamditanka (Big Eagle), a Mdewakanton soldier.*" *(NSBMRV 2010b)*

Birch Coulee (Dakota Culture, Military) - Renville County
This encompasses a larger geography than the dedicated battlefield site. The area encompasses land surrounding the site as well as the coulee all the way to the Minnesota River.

Camp Cemetery (Religion) - Renville County
Cemetary - Church is no longer on site but there is an occasional burial. (Mark Tjosaas)

Camp Pope - Little Shakopee Village Site (Dakota Culture, Military) - Redwood County
Balance of Camp Pope - 3500 soldiers garrisoned there in 1863 (Loran Kaardal)

Cedar Rock Ranch (Dakota Culture) - Redwood County
60 acre Dakota Vision Quest Site. (Loran Kaardal)

Clam Shelling Site (Early Commerce) - Redwood County
Clam shell harvesting by an Iowa company for shirt buttons. (Loran Kaardal)

Fort Ridgely
© Ron Bouldan

Fort Ridgley Historic Site (Military) - Renville and Nicollet County
"In 1853, the U.S. military started construction on Fort Ridgely, near the southern border of the new reservation and northwest of the German settlement of New Ulm. The fort was designed as a police station to keep peace as settlers poured into the former Dakota lands. Nine years later, unkept promises by the U.S. government, nefarious practices by fur traders and crop failure all helped create tensions that erupted into the U.S.-Dakota war in August 1862. Dakota forces attacked the fort twice-on Aug. 20 and Aug. 22. The fort that had been a training base and staging ground for Civil War volunteers suddenly became one of the few military forts west of the Mississippi to withstand a direct assault. Fort Ridgely's 280 military and civilian defenders held out until Army reinforcements ended the siege." (NSBMRV 2010c)

Fort Ridgely & Dale Church Cemetery (Religion, Military) - Renville County
Church no longer used except for special occasions. Cemetery contains graves from early settlement. Occasional burial still occurs. (Mark Tjosaas)

Fort Ridgley to Fort Abercrombie Road (Military, Transportation) - Renville County
Trail that connected Fort Ridgely to Fort Abercrombie in North Dakota. (Mark Tjosaas)

Fort Ridgely Cemetery (Religion, Military, Important People) - Nicollet County
Cemetery includes monuments to those killed at Redwood Ferry and a Chippewa chief who helped settlers (Chief Mouzoomaunee, Capt. John S. Marsh, Eliza Muller). Also contains graves that date to the period of the fort. (Mark Tjosaas)

Fort Ridgley State Monument (Military) - Nicollet County
A 52 ft. granite monument commemorating the heroism of the fort's defenders during its nine day siege in the Dakota - US Conflict of 1862. (Tom Ellig)

Old Fort Road (Military, Transportation) - Nicollet County
Connected Fort Ridgely to St. Peter, MN. (Mark Tjosaas)

Golden Gate Townsite (Ghost Town) - Brown County
Former townsite. Sign Identifying the townsite is located on MN Hwy 4. Townsite is located east of the highway on private property. (Mark Tjosaas)

Harkin's General Store (Early Commerce) - Nicollet County
"1870's general store managed by the Nicollet County Historical Society. When the railroad passed by the small town of West Newton, the store was forced to close with much of the unsold inventory still on the shelves, where it remains today." (MNHS 2010)


Harkin's General Store
© Kristi Fernholz

Hazlewood Republic (Dakota Culture, Religion) - Yellow Medicine County
"Founded by Stephen R. Riggs, this mission was located near the Upper Sioux Agency. The mission included a school and numerous Christian Dakota farming families who broke with the communal tribal structures and formed a self-governing organization called the Hazelwood Republic.
Upper Sioux Community." (Bloomington 2010)

Joseph R. Brown (Military, Important People) - Renville County
"*The Joseph R. Brown State Wayside Rest displays the granite ruins of Brown's home from 1862. Destroyed during the U.S./Dakota Conflict of 1862, the three story home was a mansion compared to normal pioneer homes. Brown's family was spared because of his wife's Native American heritage. Brown was a politician, inventor, publisher and Indian Agent*." *(NSBMRV 2010b)*


Joseph R. Brown State Wayside
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Little Crow Village/Camp Site (Dakota Culture, Important People) - Redwood County
Location of Little Crow's village. Little Crow was an important chief among the Dakota during the US - Dakota conflict (Science View 2010).

Lower Sioux Agency
© Kristi Fernholz

Lower Sioux Agency Historic Site (Dakota Culture, Military) - Redwood County
"*In 1853 the U.S. Government established the Agency to administer treaty obligations with the Dakota people living on reservations along the Minnesota River. Explore the history and culture of the Dakota, learn how government employees and missionaries sought to change their traditional way of life at the agency, and discover the roots of the U.S.- Dakota Conflict of 1862 in the visitor center exhibit.*" *(NSBMRV 2010c)*

Lower Sioux Community (Dakota Culture) - Redwood County
"The People of the Lower Sioux Indian Community are known as Dakota , and come from the Mdewakanton ("Dwellers by Mystic Lake") band. The Lower Sioux Indian Community (LSIC) is located on approximately 1750 acres held in trust status in southwestern Minnesota, bounded by Redwood County, MN and the Minnesota River. Of the tribal population, 50% live on the reservation with an approximately equal number residing within the 10-mile tribal service zone. Historic sites include St. Cornelia's Church and the Bishop Whipple School Trading Post" (NSBMRV 2010c)

Minnesota Falls Dam (Early Commerce, Other - Early Infrastructure) Yellow Medicine County
Minnesota Falls Dam was constructed by the Montevideo Power Company in 1905 and was at that time the largest long-distance electrical generating plant in the world. Now owned by Xcel Energy.

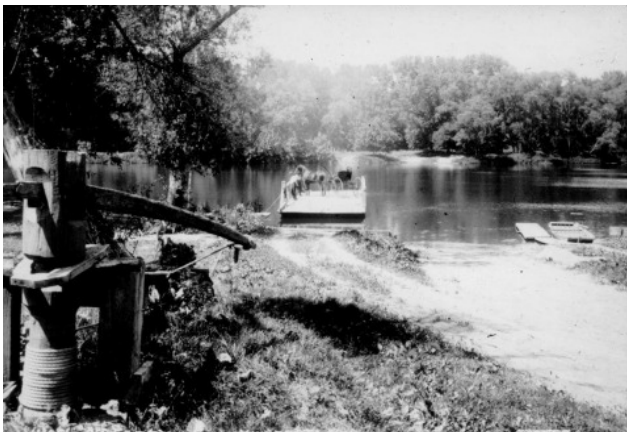
Morton Monuments (Dakota Culture, Military, Important People) - Renville County
"*On a hill overlooking the beautiful Minnesota River Valley and the city of Morton, stand two 52-foot tall granite monuments. These monuments are known as the Birch Coulee and Loyal Indian Monuments. The Birch Coulee Monument was erected in 1894 for the soldiers who fought at the Battle of Birch Coulee on September 2, 1862. The Loyal Indian Monument was erected in 1899 to honor 6 Dakota who saved lives of whites during the U.S.-Dakota Conflict of 1862.*" *(NSBMRV 2010c)*


Morton Monuments early years
Redwood County Historical Society

Post Newton Cemetery (Religion) - Redwood County
1 acre pioneer cemetery on bluffs of MN River Valley. (Loran Kaardal)

Red Rock Trading Post (Early Commerce) - Nicollet County
Site is adjacent to the MN River a distance form the nearest township road. A historical Marker has been placed on the road. (Mark Tjosaas)

Redwood Ferry (Transportation, Military) - Redwood and Renville County
The Battle of Redwood Ferry was a battle in the Dakota War of 1862. On August 18, 1862 Captain John S Marsh and his men were ambushed at the ferry site upon returning from the Lower Sioux Agency (Wikipedia 2010).


Redwood Ferry
Redwood County Historical Society

Redwood Rendering (Early Commerce) - Redwood County
Original site of pioneer recycling - rendering business.

Rice Creek Village (Dakota Culture) - Redwood County
Rice Creek Falls, Village site of "Blanket Indians", Red Middle Voice was chief. (Loran Kaardal)

Riverside (Early Commerce, Transportation, Ghost Towns) - Redwood County
Riverside existed in the 1870's. Included a general store, hotel, and grain warehouse. Steam boats from New Ulm came with freight and carried grain back down river. (Loran Kaardal)

Schwandt Memorial (Military) - Renville County
"The Schwandt Memorial Monument was erected on August 18, 1915, near the spot where the Johan Schwandt family was murdered in the U.S.-Dakota Conflict of 1862. It was erected in memory of the 6 Schwandt family members and 2 of their friends that were killed on August 18, 1862. Two of the Schwandt children survived the attack. The daughter, Mary, was taken captive, but was protected by a Dakota woman, Snana. The son, August, managed to crawl away." *(NSBMRV 2010b)*

Springville Mine (Early commerce, Ghost Town, Other - Early Recreation) - Redwood County
13 acre site of Goldmine and Springville town site. Pioneer recreation site. (Loran Kaardal)

Town of Minnesota Falls (Ghost Town) - Yellow Medicine County
"Located on the west side of the Minnesota River near the Minnesota Falls Dam is the site of the abandoned town of Minnesota Falls. The town was essentially wiped out in a flood during the spring of 1881." (Weeks 2010)

Union (Doncaster) Cemetery (Dakota Culture, Religion) - Yellow Medicine County
Union Cemetery is also referred to as Doncaster. Chief Big Eagle and other Dakota are buried there.


Upper Sioux Agency
© Kristi Fernholz

Upper Sioux Agency (Dakota Culture, Military) - Yellow Medicine County
"The Upper Sioux Agency (or Yellow Medicine Agency) was established by the federal government in 1854 to be a center for instructing the Dakota People in farming methods. The park offers three campgrounds, 18 miles of trails, two picnic areas, river fishing, and two rental tipis. It is listed in the National Register of Historic Places."
(NSBMRV 2010b)

Woodlake Battlefield Monument (Military) - Yellow Medicine County
"*On September 19, 1862, Col. Henry Hastings Sibley set out from Fort Ridgely with 1,500 volunteers to put down the Santee uprising. As they neared Wood Lake on September 23, Sibley's men escaped an ambush by 700 warriors under Chief Little Crow and engaged them in a battle. Sibley's force won the day inflicting heavy casualties on the Sioux. For this action, Sibley received a promotion to brigadier general. Wood Lake was the first decisive defeat of the Sioux since the uprising began.*" *(NSBMRV 2010b)*

Woodlake Battlefield Site (Military) - Yellow Medicine County
This encompasses the proposed location of the larger battlefield.

Yellow Medicine City (Early Commerce, Ghost Town) - Yellow Medicine County
"The city was founded in 1866 and platted June 10, 1869, was on the south side of the river of this name, about a mile west of the site of the former Yellow Medicine or Upper Sioux Agency. This village was designated as the county seat early in 1872, but in accordance with the vote of the people in 1874 the county offices were removed in December of that year to Granite Falls, which has since been the county seat. During 1875-80 the area of the Yellow Medicine village site reverted to farming land." (Rootsweb 2010)

"The first village in Yellow Medicine County was located about ½ mile southwest of this marker. John Winter settled there in 1866. In 1868 Hoxie established a store and Gorham Powers a law office. In 1869 George Olds platted the village, a stage station and a brick hotel were built and Joseph Fortier opened another store.

A post office and mail route to Redwood Falls was established in 1870. In January 1872 Yellow Medicine City, with a population of 40, became the county seat. The county seat of government was moved to Granite Falls in 1874. Yellow Medicine City was abandoned in 1878." (HMSA 2010)

Zoar Mission/ Wabasha Village Site (Dakota Culture, Religion) - Redwood County
"*John P. Williamson, son of Dr. Thomas S. Williamson, founded this mission, which was located near the Lower Sioux Agency. Most of its members had been affiliated with the mission at Kaposia. The mission was temporarily closed at the outbreak of the U.S. Dakota War of 1862 and resumed operation in November 1862. Shortly thereafter, its members were marched under armed guards to the Fort Snelling Dakota Internment Camp.*" (Bloomington 2010)

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