ECOREGIONAL PLANNING IN THE NORTHERN TALLGRASS PRAIRIE

PREPARED BY

The Nature Conservancy®

**Northern Tallgrass Prairie
Ecoregional Planning Team**

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TABLE OF CONTENTS

TABLES, FIGURES AND APPENDICES

TABLES

FIGURES

APPENDICES

ACKNOWLEDGMENTS

Chapter 1:

Ecoregional Planning and the Northern Tallgrass Prairie

1.1   BACKGROUND

1.1.1   Introduction

In November 1995, The Nature Conservancy laid out its organizational vision in <u>Conservation by Design: A Framework for Mission Success</u> (The Nature Conservancy 1996a). As set out in that framework, the Conservancy recognized that above all, it "*must identify goals and strategies that generate the greatest conservation impact in the shortest possible time*." These goals and strategies will both lead the way and provide benchmarks for measuring progress toward mission success.

The Conservancy's conservation goal is succinctly stated as "*the long-term survival of all viable native species and community types through the design and conservation of portfolios of sites within ecoregions*." The targets of the organization's conservation work which will enable fulfillment of this goal are "*all viable native community types and all viable vulnerable native species*." Within each ecoregion, the Conservancy will identify the species and natural communities which will be the targets of conservation action, and develop a portfolio of sites which collectively conserves these targets, both rare and representative. Long-term viability will be ensured by protecting "*multiple, viable or recoverable occurrences*" of targets and conserving or restoring the ecosystem patterns and processes they need to survive.

Preferred conservation strategies will achieve the Conservancy's single-minded goal and mission by focusing on "*high-quality sites that simultaneously conserve multiple, unprotected targets*," and giving preference to "*sites that hold greatest promise for long-term sustainability*." These strategies are hypotheses as to what will provide maximum return on conservation investment and reap long-term success in conserving the full array of biodiversity in an ecoregion. As information improves and conservation strategies are found wanting, the strategies must change. Responding effectively to a shifting target is at the heart of adaptive ecosystem-based management, and the Conservancy's new conservation framework seeks to make the organization more adaptive to change.

The use of ecoregions (large geographic areas with similar climate and landform) as planning units will ensure that targets are addressed within an ecological context. The Conservancy has identified ecoregions, largely adapted from Bailey (1995), that will provide structure for ecoregional planning in the United States (The Nature Conservancy 1996b). Ecoregion units for the Canadian Plains tentatively have followed those delineated by the Ecological Stratification Working Group (1995) until formal boundaries are adopted by the Conservancy.

It should be pointed out here that although this is the approach the Conservancy has chosen to address biodiversity conservation, it may not encompass all that could be done to protect biodiversity. Other approaches by other management and conservation agencies/organizations (as well as that of private landowners) will undoubtedly enhance biodiversity conservation well beyond what is laid out in this report. Moreover, it is well beyond the capabilities of the Conservancy to accomplish all that is called for in this ecoregional conservation plan. It will be imperative, then, for the Conservancy and all stakeholders in the ecoregion to work cooperatively to protect the biodiversity of this ecoregion. To achieve this lofty goal, however, will require a great amount of understanding, cooperation, resources and time. This ecoregional plan should serve as an important resource to guide those cooperative ventures.

1.1.2 The Structure of Ecoregional Planning

In the Northern Tallgrass Prairie, ecoregional planning was conceptualized as occurring in three principle stages: Assessment, Design and Implementation (Figure 1). Each stage was envisioned as an ongoing iterative process within a larger effort that through time is refined as new information becomes available. Additionally, each is not exclusive of the others and all may be operating simultaneously. Information needed to refine the next iteration of the ecoregional planning was identified in each respective stage.

Figure 1: Ecoregional Planning

ASSESSMENT   **DESIGN**   **IMPLEMENTATION**

IDENTIFYING TARGETS   EVALUATION   DEFINING ASSEMBLY PROCESS   EVALUATION   DEVELOPING ACTION PLAN   EVALUATION

SETTING CONSERVATION GOALS   COMPILING DATA   ASSEMBLING PORTFOLIO   SETTING PRIORITIES   SITE CONSERVATION PLANNING   CONSERVATION ACTION
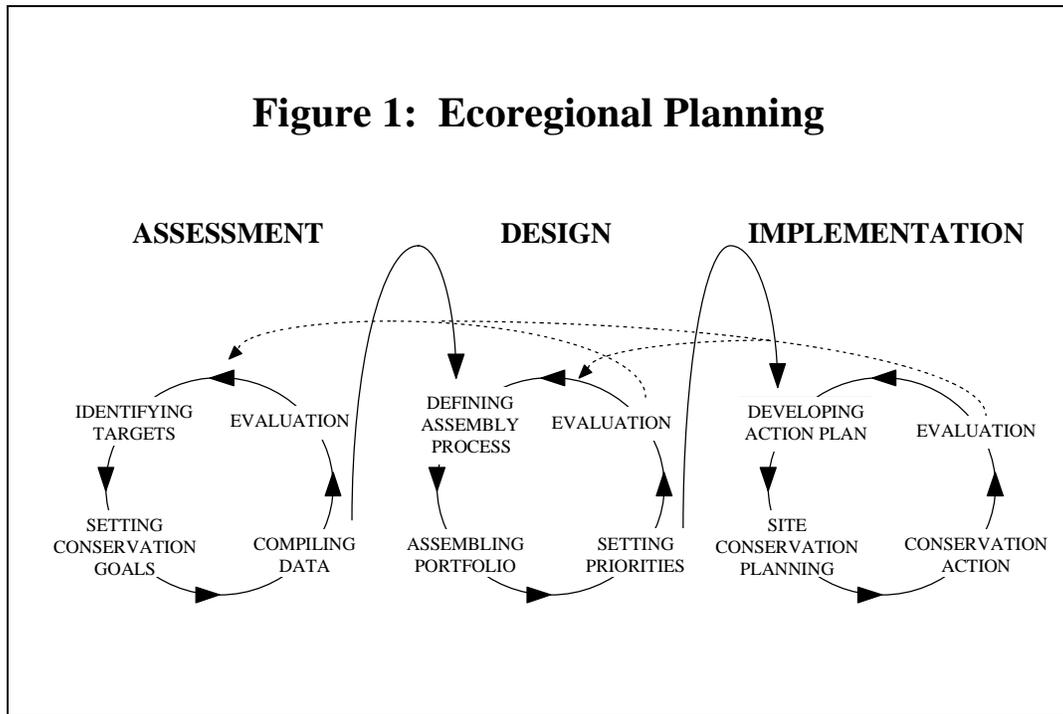
Assessment has as its goal the identification of conservation targets, setting viability guidelines and conservation goals for those targets, and assembling of the base data required for portfolio design (see Chapter 2).

Design is the process of assembling and prioritizing a suite of sites that most efficiently and sustainably captures an ecoregion's biological diversity. Inherent within this stage is the development and adoption of a process for assembling the portfolio. Science will provide the key insights for designing a portfolio that will ensure species and community viability (see Chapter 3). Also included within this stage is the prioritization of portfolio sites for conservation action.

Implementation, in its purest sense, is the execution of an action plan to address the long-term protection of biodiversity in the ecoregion and to prioritize and fill data gaps for critical future iterations (see Chapter 4).

1.2   The Northern Tallgrass Prairie

1.2.1   The Northern Tallgrass Prairie Conservation Goal

The Conservancy's conservation goal for the Northern Tallgrass Prairie is the long-term survival of all viable native species and community types occurring within the ecoregion. We will contribute to this goal by:

> ⇘   designing a portfolio of sites that, when conserved, will serve to maintain this biodiversity over the long term; then
>
> ⇘   identifying and implementing the strategies needed to conserve those sites.

1.2.2   Northern Tallgrass Prairie Ecoregion Units

Prairie Parkland (Temperate) Province
> Red River Valley Section (251A)
>> *Lake Agassiz Plain Subsection (251Aa)*
>> *Souris/Agassiz Stratified Sand Deposits Subsection (251Ab)*
>
> North-Central Glaciated Plains Section(251B)
>> *Upper Minnesota River/Des Moines Lobe Subsection (251Ba)*
>> *Outer Coteau des Prairies Subsection (251Bb)*
>> *Inner Coteau des Prairies Subsection (251Bc)*
>> *Northwest Iowa Plains Subsection (251Bd)*
>> *Southern Des Moines Lobe Subsection (251Be)*
>> *Yankton Hills and Valleys Subsection (251Bf)*

Eastern Broadleaf Forest Province
> Lake Agassiz Aspen Parklands Section(222N)
>> *Aspen Parklands Subsection (222Na)*

1.2.3   An Ecological Description of the Ecoregion

Stretching from Lake Manitoba in the province of Manitoba, south to the city of Des Moines, Iowa, the Northern Tallgrass Prairie ecoregion covers parts of five U.S. states and one Canadian province (Figure 2) and lies on the northeastern corner of the Great Plains. In all, the ecoregion encompasses 73,234 square miles (117,859 km^2) or 7.2 percent of the Plains. The ecoregion is composed of three ecoregion sections (as delineated by Keys and Carpenter 1996) from two different ecoregion provinces. Although the vast majority of the ecoregion falls within the Prairie Parkland (Temperate) province, the Lake Agassiz Aspen Parklands section of the Eastern Broadleaf Forest province was included due to its predominant prairie vegetation.

Historically, the Northern Tallgrass Prairie ecoregion was dominated vegetatively by tallgrass prairie and emergent wetlands, with riparian forests, woodlands, oak savannas and aspen parkland scattered intermittently across the landscape. Today, the vast majority of the ecoregion has been converted to agricultural land uses.
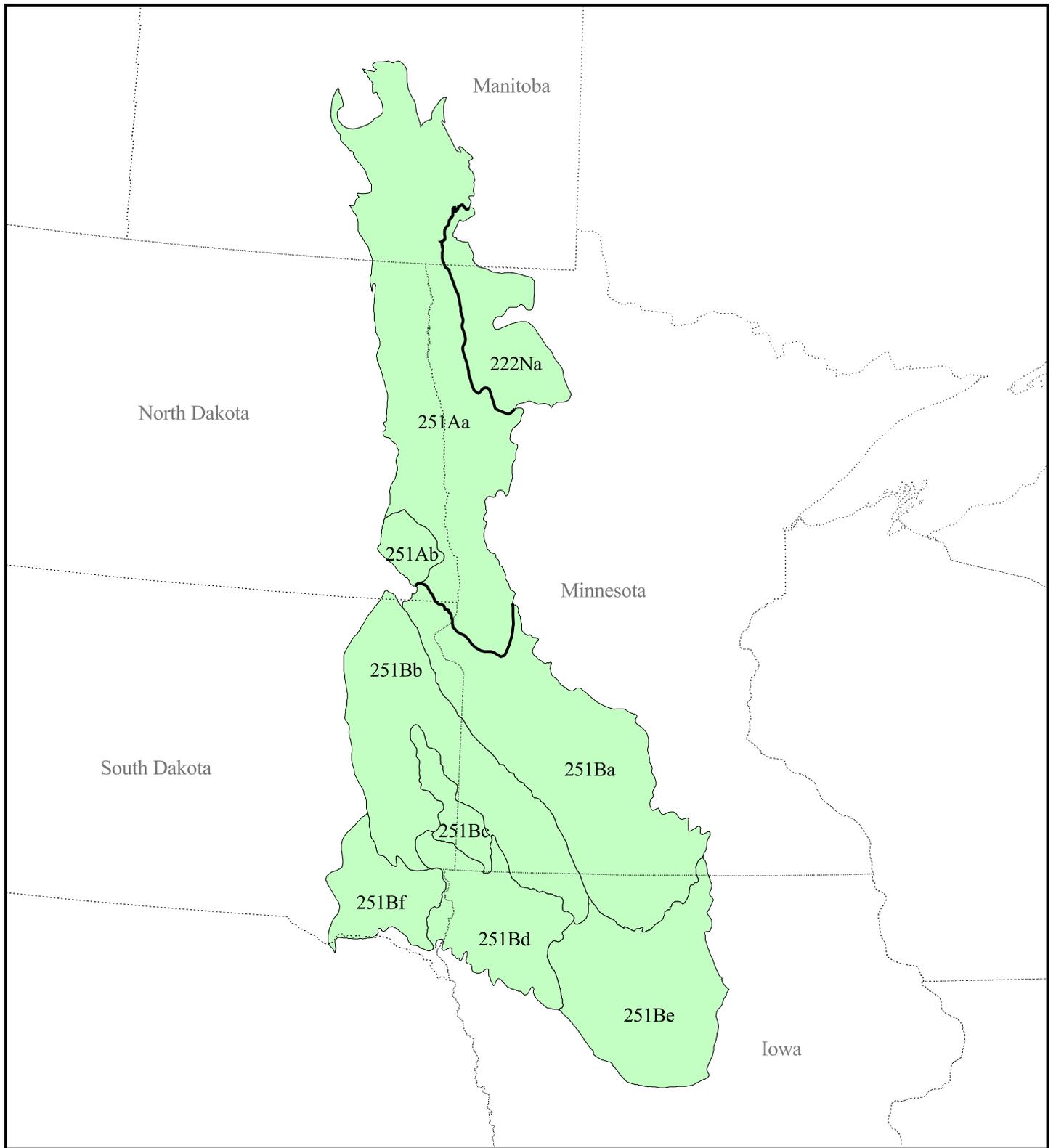
Figure 2: Northern Tallgrass Prairie Ecoregion Planning Unit

Map produced by TNC's Midwest Conservation Science Department. Copyright May, 1998.

Section and subsection lines in the U.S. from US Forest Service, 1995.
Section and subsection lines in Canada from Canada Soil Inventory, 1989.

Although highly variable in composition, the prairies of the ecoregion are dominated by big bluestem (*Andropogon gerardii*), prairie dropseed (*Sporobolus heterolepis*), porcupine needlegrass (*Stipa spartea*), Indian-grass (*Sorghastrum nutans*) and soft-leaf muhly (*Muhlenbergia richardsonis*) (Weaver 1954, Watts 1960, Diamond and Smeins 1988, Albert 1995). The vegetation of the Lake Agassiz Aspen Parklands section is in many ways distinct from the rest of the ecoregion, occurring as a mosaic of prairie, wet prairie, wetlands, brush prairie, and aspen-oak parkland. A high proportion of the landscape is dominated by shrubs rather than trees, principally willow (*Salix* spp.), dwarf birch (*Betula glandulifera*), shrubby cinquefoil (*Pentaphylloides floribunda*), hazelnut (*Corylus* spp.), and saskatoon (*Amelanchier* spp.). Aspen-oak parkland, with groves of trembling aspen (*Populus tremuloides*) and scattered bur oak (*Quercus macrocarpa*), occurred in fire-protected areas.

The geomorphology of the Northern Tallgrass Prairie ecoregion is varied, but is largely a direct or indirect result of the Wisconsinan glaciation. The flat terrain of the Red River Valley had its origin as a large, level proglacial lacustrine plain (Glacial Lake Agassiz), while the region to the south is primarily level to rolling till plain (McNab and Avers 1994). Prominent alluvial fans formed where the Pembina and Sheyenne Rivers entered Glacial Lake Agassiz from the west. The deep, broad valley of the Minnesota River was an outlet of Glacial Lake Agassiz. Beach and morainal ridges border the Red River Valley on the east, while a series of additional morainal ridges occur in the central portion of the region. The Coteau des Prairies, a moderately dissected, relatively high plateau with a much thinner cover of till is prominent on the west-central edge of the region. Low dunes, beach ridges and wet swales form the western edge of the Aspen Parkland section, these providing a barrier that reduced both historic fire frequency and intensity, resulting in dominance by shrubs, trembling aspen and balsam poplar. Other features in the ecoregion include abundant kettles and wetlands.

Elevation ranges from 750-2,000 feet (229-610 meters). Pleistocene till, stratified drift or lacustrine sand-silt-clay-peat-muck mantle almost the entire region, covering bedrock to a depth of 200-400 feet (61-122 meters) in the north and 30-300 feet (9-91 meters) in the south (McNab and Avers 1994, Albert 1995). Quaternary alluvium covers the lacustrine sediments in the fans and major river valleys. Soils are principally Mollisols (Entisols in the Aspen Parkland), with a small amount of Entisols, Alfisols and Histosols.

1.3   Historical Factors Impacting the Biodiversity of the Ecoregion

The Northern Tallgrass Prairie is a highly modified ecoregion. The effects of human activities on the natural landscape and its biodiversity over the past 150 years have been numerous and severe. Today, less than 4 percent of the natural vegetation historically occupying the ecoregion remains (Samson and Knopf 1994). Similarly, aquatic systems also have been significantly degraded. What follows is a general discussion of the current status of the biodiversity in the ecoregion within a historical context.

1.3.1   Terrestrial Systems

The first significant impacts of the Euro-American culture on the biodiversity of the Northern Tallgrass Prairie occurred before wholesale settlement. 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. 1997). By the mid-1800's, most bison were already extirpated from the ecoregion, with the last wild bison in Minnesota recorded in 1880 (Nordquist and Birney 1988). Elk (*Cervuus elaphus*) were eliminated from the Northern Tallgrass Prairie by the late 1800's, the last disappearing from Minnesota

(Roseau County) in 1896 (Nordquist and Birney 1988). Wolves (*Canis lupus*) persisted in remote areas of the Plains region until the early 1900's. Only now, after years without market hunting and bounties, have elk and wolf populations become established again in portions of the ecoregion. Trumpeter swans (*Cygnus buccinator*) and whooping cranes (*Grus americana*) were extirpated from the ecoregion long before their marshes were drained (Green 1988).

Shortly after the arrival of Euro-American settlers and their land-use practices, a rapid alteration of the prairie landscape took place with respect to the species and natural communities of the ecoregion. In a period of 8 years (approximately 1870-1878), much of the tallgrass prairie was transformed from a continuous sea of grass into a highly fragmented system with little prairie remaining (Krenz and Leitch 1993). Lands made available through the Homestead Act of 1862, the U.S. Timber Culture Act, the Canadian Dominion Land Act of 1872, and the sale of railroad lands to fund construction of transcontinental railroads, resulted in the rapid settlement and conversion of the tallgrass landscape.

In the Northern Tallgrass Prairie, patterns of plants, animals and natural communities were structured by natural ecological processes operating across a wide range of spatial and temporal scales, from the very large to the small. The large-scale (evolution, species migrations, climate and broad-scale topographic patterns), intermediate-scale (drought, fire, large mammal grazing and local topographic patterns), and small-scale (small mammal mounds, local immigration, local extinction events, and interactions among species) processes created an array of habitats in an otherwise nondiverse landscape (Steinauer and Collins 1996). The tallgrass prairie system, in its essence, was a network of complex interactions between species, natural communities and the ecological processes that shaped them.

These complex interactions were altered significantly through a long course of actions initiated after the arrival of Euro-Americans in the region (Apfelbaum and Chapman 1996). Prior to settlement, the prairie landscape was a complex system with a diversity of interspecific interactions (Figure 3). As size and quality of prairie habitat declined after settlement and the distance between remaining fragments increased, many species with large habitat requirements were lost from or dramatically reduced in the ecoregion (e.g., wolves, elk). As habitat continued to decline and additional species were lost, interactions disappeared; the resultant system was simplified greatly and may be less able to renew itself or respond to changes in the environment.

Beyond the ubiquitous loss to agricultural conversion, the quality of remaining natural communities also has deteriorated due to an array of current and past land uses. The loss of rangeland in the ecoregion has resulted in an increase in grazing pressure on remnant prairies throughout the ecoregion. Suppression and alteration of the natural fire regime has resulted in encroachment of tree and shrub species and a general decline in system vigor. Exotic species have become common and widespread through many of the few remaining prairie remnants. Those prairie areas that have survived conversion to date contain a smaller proportion of the typical grassland community types and a larger proportion of nontypical or azonal types than occurred historically (Chaplin et al. 1996).

Despite the tremendous loss of habitat, few species in the Great Plains (including the Northern Tallgrass Prairie), relative to other large geographic areas of North America, are considered imperiled or have declined sufficiently in numbers to be listed by the U.S. government as endangered or threatened (Ostlie et al. 1997). The Northern Tallgrass (like the Great Plains as a whole) generally is populated by relatively common species with broad geographic ranges. Only recently have population trends of some "common" species exhibited significant sustained declines. Perhaps the poster-children

Figure 3: Changes in the Prairie Ecosystem
Presettlement to Present Day
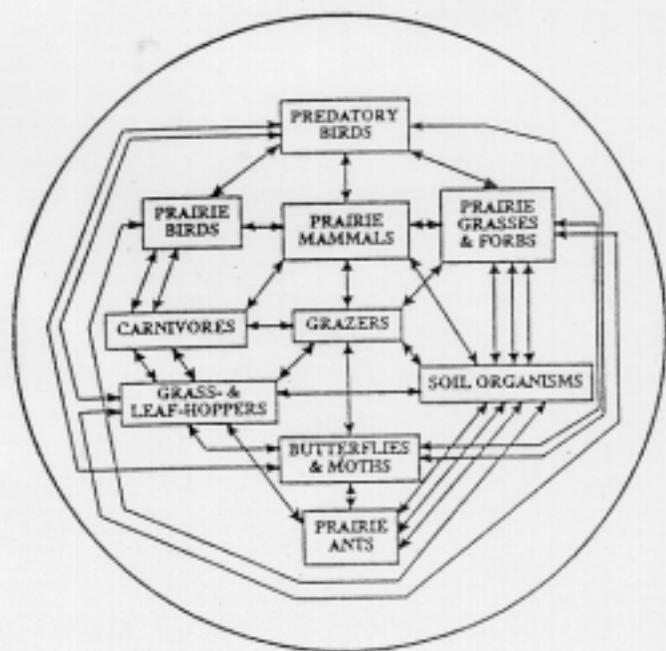
1790: Average Prairie
1,000,000 acres
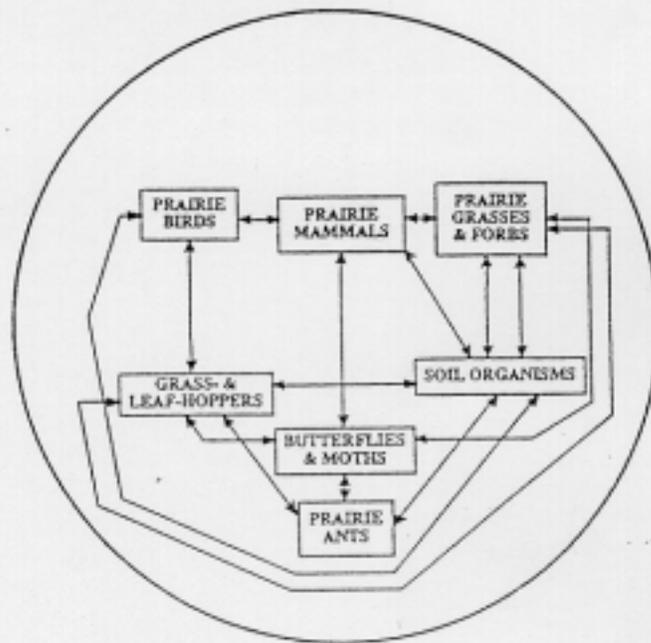
1890: Average Prairie
1,000 acres
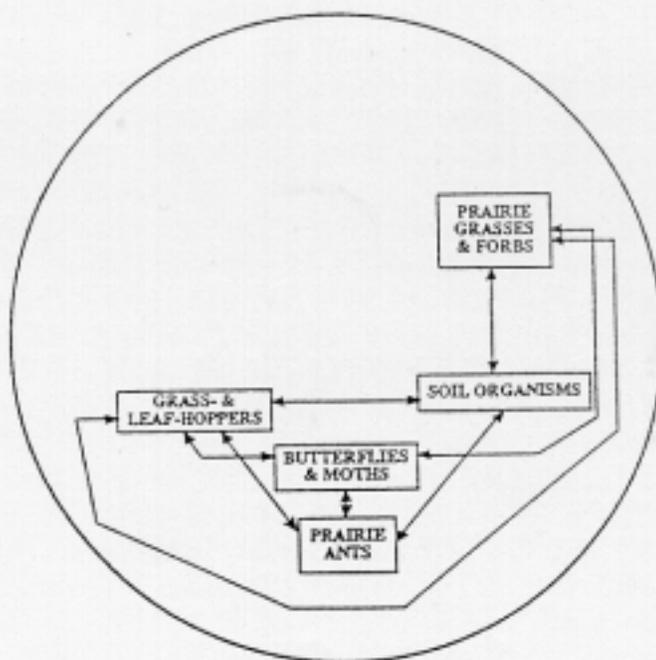
1990: Average Prairie
40 acres

(From: Apfelbaum, S.I. and K.A. Chapman. 1996. Ecological restoration: A practical approach. *In* M.S. Boyce and A.W. Haney (eds.), Ecosystem management: Applications for sustainable forest and wildlife resources. Yale University Press, New Haven, Conn.)

of this trend are the grassland birds. As a group, grassland-nesting birds have suffered more consistent, widespread and steeper declines in the past quarter century than any other major bird group (Knopf 1994).

1.3.2 Aquatic Systems

As with terrestrial systems, aquatic systems in the Northern Tallgrass Prairie were structured by natural ecological forces operating at different scales. The complex interactions inherent within these systems were altered significantly through a long course of actions initiated after the arrival of settlers in the region. As upland prairie habitat was converted to agriculture after settlement, wetlands were drained, and rivers and streams channelized, and habitat available for aquatic organisms declined.

Like terrestrial systems, the loss and degradation of aquatic systems in the Northern Tallgrass Prairie has been significant. By the mid-twentieth century, many of the wetlands of the region had been drained and stream and river courses altered through channelization. Drainage of potholes and tiling of seasonal wetlands created farmable acreage from previously untillable lands. In a period of 15 years (1879-1893), Manitoba, Minnesota and North Dakota all adopted wetland drainage legislation (Krenz and Leitch 1993). Construction of drainage ditches coupled with channelization of rivers expedited runoff from the landscape. 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.

The introduction and establishment of nonindigenous fish has significantly affected the distribution and survival of many native aquatic organisms. An assessment by Boydstun et al. (1995) documented 404 exotic and non-native fish species occurring in the United States. Numbers of non-native fish within states composing the Northern Tallgrass Prairie range from 38 in Minnesota to 15 in North Dakota. Thirty-five occur in South Dakota, while 28 have been documented in Iowa.

Chapter 2:

Ecoregional Assessment

2.1   Background Information

As stated previously, ecoregional planning in the Northern Tallgrass consisted of three distinct stages. Assessment was the stage where conservation targets were identified, target viability guidelines and conservation goals set, and data critical to the process compiled. Information from this stage was used in the design stage to assemble a portfolio of sites and determine what further actions were required.

The specific assessment process adopted for use in the Northern Tallgrass Prairie is described in detail within this chapter. It should be noted, however, that this ecoregional planning process predated the guidelines established by the Conservancy for ecoregional planning (i.e., Geography of Hope). Although the Northern Tallgrass planning process assisted in the development of the organization's guidelines, significant modifications to the original course of actions were required in the assessment stage.

2.1.1   Team History

A Northern Tallgrass Prairie Ecoregional Assessment Team was organized and first met at the Conservancy's Midwest Regional Office in Minneapolis, Minnesota in November 1995. The role of the Assessment Team was to identify the data needs, develop the methodologies for obtaining the data, and compile information necessary for the later stages of ecoregional planning.

Building on the outcome of two fall 1995 meetings (one for Great Plains and the other for Midwest State Directors), teams were identified to begin implementing the vision of the Conservancy's conservation framework on an experimental basis. The Northern Tallgrass Prairie ecoregion was one of two arenas selected for this experiment in the Great Plains because of the relatively high level of biological inventory conducted within its borders.

The organizing members of the Northern Tallgrass Prairie Ecoregional Assessment Team were Wayne Ostlie (Assessment Team Leader: Great Plains Program), Steve Chaplin (MRO), Kim Chapman (MNFO), Don Faber-Langendoen (MRO), Karen Poiani (National Stewardship Team), Rick Schneider (formerly Great Plains Program) and Hal Watson (MRO). After working independently (and largely in a vacuum) for a period of time, it became imperative that the team be expanded to included broader participation of Conservancy Field Offices and Heritage/CDC programs. At that point, the following individuals became critical members in the Assessment Team: Robert Dana, MN NHNR, Jason Greenall, MB CDC, Darla Lenz, ND NHI, Clint Miller, Northern Tallgrass Prairie, Dave Ode, SD NHDB, John Pearson, IA NAI, Andy Schollett, DKFO, Jerry Selby, IAFO, and Brian Winter, Northern Tallgrass Prairie. Also, since initiation of the assessment stage, Rick Schneider left the team and was replaced by Jon Haferman (MRO).

2.2 The Assessment Process: Approach and Rationale

Because the Northern Tallgrass Prairie ecoregion was among the first to undertake ecoregional planning under the Conservancy's new guidelines, there were no in-house models to follow. Consequently, the process of accumulating data and products critical to the design of a conservation portfolio was a learning experience...and there were ample opportunities to learn. Many of the products under development were revised numerous times as the planning process itself was modified. These and other "lessons" learned during the course of ecoregional planning are discussed in detail later in this report (see Section 5.2). What follows in this chapter is an identification and discussion of the products deemed

critical for the design of the ecoregional portfolio.

Although this and subsequent chapters are laid out in a linear framework, they are done so primarily to aid in understanding the planning process. In actuality, ecoregional planning (as a whole) is a very non-linear process.

2.3   Critical Assessment Products

In the Northern Tallgrass Prairie, seven primary products were found to be critical for later assembly of the ecoregional portfolio. These primary products (each of which are discussed in detail below) included:

- A list of ecoregional conservation targets (species and natural communities);
- An element occurrence data base for ecoregional targets;
- Viability guidelines for target occurrences;
- Ecoregional conservation goals for each target;
- A GIS coverage of identified conservation sites (landscape, macrosite and standard site) within the ecoregion;
- A GIS coverage of managed area boundaries; and
- Documentation of identified data gaps.

The rationale for developing these data for use in ecoregional planning is discussed in this chapter. These data were utilized throughout the design process in various capacities as illustrated in Figure 4. For additional insight into the use of these data in later stages of ecoregional planning, refer to chapters 3 (The Ecoregional Portfolio Design) and 4 (From Assembly to Implementation).

Figure 4: Ecoregional Assessment
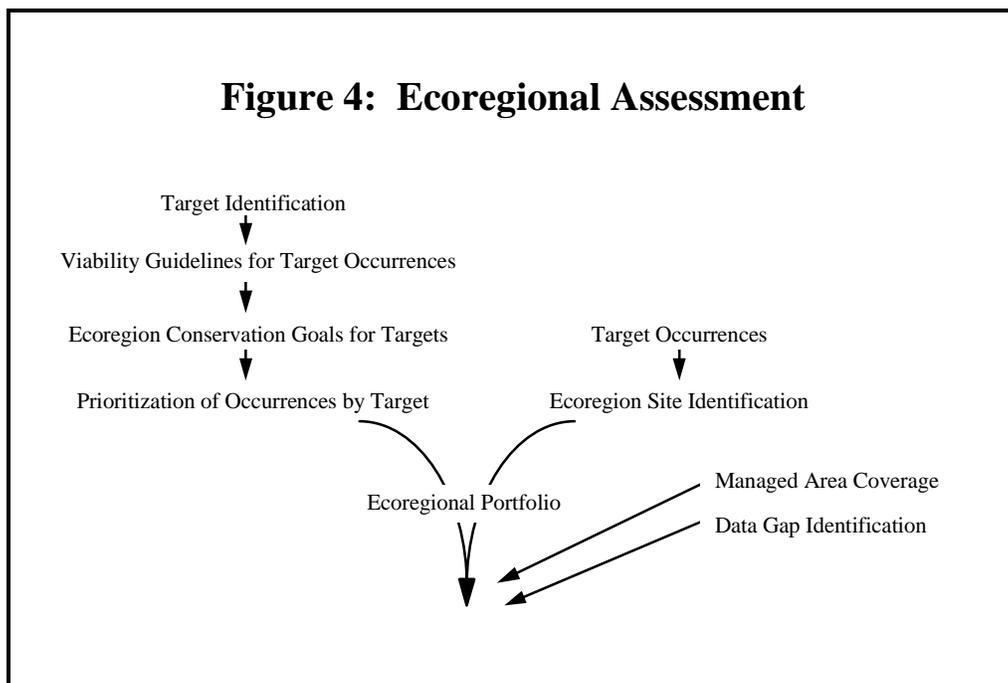
A Geographic Information System (GIS) environment was quickly identified as the most efficient and flexible means of conducting ecoregional assessments and analyses. The system helped clarify the

relationships between species and natural community locations, land management, conservation sites, landscapes and other pieces of the biodiversity puzzle. In addition, the ability to create and easily revise informative maps and coverages proved absolutely essential in moving the process along rapidly and in a time-efficient manner. Electronic GIS coverages, data bases and reports generated from data bases were the primary products required to initiate the design stage. Data (both tabular and spatial) developed in the course of this planning effort have been storehoused at the Conservancy's Midwest Regional Office GIS lab (see Appendix 1).

2.3.1   Element Occurrence Data Base for Ecoregional Targets

Goal: Assembly of an ecoregional data set of documented element occurrences using Heritage/CDC element occurrence data bases (and other sources) for use in ecoregional analyses and portfolio design.

As a first step in assessment, it was imperative that an element occurrence data set be assembled from each of the Natural Heritage and Conservation Data Center programs in the ecoregion. It was from this data base that the primary targets of ecoregional planning would be identified. As such, this data set would serve as the backbone from which the ecoregional plan would be assembled.

Prior to ecoregional planning work within the Northern Tallgrass Prairie, a multi-state/province Great Plains element occurrence data base had been assembled by the Conservancy's Midwest Regional Office for use by the Great Plains Program. An ecoregional subset of these data was clipped for use by the Northern Tallgrass Prairie Ecoregional Assessment Team to conduct analyses and construct pertinent data layers. This data set was instrumental in not only identifying conservation targets within the ecoregion, but also their locations. This data base was enhanced through knowledge obtained from an array of sources and was utilized throughout the course of this project.

2.3.2   Conservation Targets

Goal: Identification of the species and natural communities for which an ecoregional portfolio of sites will be assembled.

A second critical step was to identify the specific species and natural communities that would be the targets of ecoregional planning. Traditional conservation targets employed by The Nature Conservancy have included those species and communities considered to be globally imperiled (ranked G1-G3). However, the goal of Conservation by Design (The Nature Conservancy 1996a) is the protection of *all* species, both common and rare. Conservation action for rare species is feasible on a species by species basis, but this approach is not effective for the extraordinarily high number of other, more common species (including those which we knew little about) found in an ecoregion. Instead, by protecting a sufficient number of viable examples of each natural community type in the ecoregion, it is assumed that all common species (including those which we know little about) will also be protected. This, in essence, is the full application of the coarse filter/fine filter approach to conservation and is the backbone of Conservation by Design. Because this assumption (i.e., that the protection of all natural community types across their full range of variability will sufficiently encompass all common species as well as those species that are not well known) carries risks, it is imperative that the final portfolio be tested to ensure this assumption.

Once targets had been identified, they were separated into two categories (primary or secondary targets)

to delineate the role they would play in the assembly of the ecoregional portfolio (see Section 3.2.2). Primary targets, because of their imperiled nature (G1-G3 species) or their dominant role as a coarse filter in the ecoregion (endemic, limited or widespread communities), warrant special consideration. Secondary targets (although important to the integrity of the portfolio design as a whole) are less characteristic of the ecoregion (community types largely peripheral to the ecoregion) or less imperiled and more likely to be captured within the coarse filter (G4-G5 species in decline or identified to test the adequacy of the coarse filter). As such, their role in the ultimate shaping of the portfolio design will be less significant than those of primary targets.

Species

The Assessment Team reached consensus that the primary species targets (the fine filter) for the Northern Tallgrass Prairie would include all imperiled taxa (ranked G1-G3, T1-T3) and those listed or candidates for listing by the U.S. government with at least one occurrence in the ecoregion. Analyses of Heritage/CDC element occurrence data identified 32 imperiled species meeting this criteria (Appendix 2). Extirpated species were not considered as targets.

A further analysis of these target occurrences with respect to the ecoregion, coupled with discussion from the Assessment Team, suggested that five potential targets should be dropped from consideration. These included the whooping crane (only occasionally visiting the ecoregion during migration), peregrine falcon (only occurrences are reintroduced populations associated with urban skyscrapers), bald eagle (a G4 federally listed species now expanding into the ecoregion), gray wolf (a G4 species now considered for delisting as a U.S. threatened species) and flat-petal lady's-slipper (a species of questionable taxonomy with occurrences in the ecoregion likely the misidentification of more common species). The remaining 27 became the primary target species for which conservation sites would be selected in the early stages of design (see Chapter 3).

Some relatively common (G4-G5) species inhabiting the ecoregion were identified as secondary targets (Appendix 3). Initial discussion regarding what species were to be included in this list centered on those that were:

- exhibiting consistent, long-term, rangewide declines, or
- area-dependent species, or
- endemic to the ecoregion.

Because it was felt that the use of natural communities as a coarse filter largely was an untested assumption, additional common species from an array of taxonomic groups and with varying habitat needs were identified to see if they were sufficiently captured within the portfolio. These were also added to the secondary species list (see Appendix 3).

Prior to finalization, a discussion further refined this secondary species list. It was felt that vulnerable bird species would be better addressed through a broader, more comprehensive approach to bird conservation in the ecoregion (which would include migratory bird concentration areas). Similarly, vulnerable aquatic species (fish, mussels and others) would be better addressed within a broader aquatic community conservation effort. Both of these (birds and aquatics) will be important components of a comprehensive ecoregional portfolio.

Natural Communities

All 98 terrestrial natural community types identified as occurring in the ecoregion were considered conservation targets (Appendix 4). These terrestrial natural plant community types were taken from a natural vegetation classification system developed by the Conservancy and its Heritage/CDC partners (Faber-Langendoen 1996, Grossman 1998). An aquatic community classification has yet to be developed for ecoregion, and as a result, aquatic communities are not included in this first ecoregional planning iteration. It is, however, fully recognized that a means of adequately addressing aquatic communities must be developed in the second iteration.

Community distribution categories were used as a means of prioritizing the list of natural communities for inclusion into the portfolio design. Communities were assigned to one of four categories based on their distribution relative to the ecoregion: endemic (restricted), limited, widespread or peripheral (see Appendix 5). In the Northern Tallgrass Prairie, communities that were characterized as endemic, limited or widespread (39 in all) were considered primary targets, whereas peripheral communities (59 in all) were classified as secondary targets.

At the time, it was felt that there were some advantages to prioritizing the community list into primary targets and secondary targets in order to guide site selection to those of special importance in the ecoregion. Prioritizing the list also was helpful because community information was incomplete and the task of gathering information on all communities rather daunting. In retrospect, it would have been better to consider all types as primary targets. Ecoregional conservation goals established for peripheral species alone (lower than that of endemic, limited or widespread types) would have served as an effective means of placing greater emphasis on types more characteristic of the ecoregion while maintaining the value of peripheral communities as coarse filter targets.

2.3.3 Viability Guidelines

Goal: Identification of the ecological factors required to sustain occurrences of conservation targets over the long term.

A third component of assessment was determining what environmental conditions were required to maintain target occurrence viability over the long term. This step in the planning process set baseline viability limits for target occurrences. The Conservancy and its Heritage/CDC partners use a methodology called Element Occurrence ranking as a means of assessing viability (see below). In general, however, such viability guidelines were not available for most conservation targets. This was particularly true for natural communities. Because detailed information was not available for most targets, general viability guidelines were sometimes developed for groups of targets.

When available, Element Occurrence Ranking Specifications (EORANK SPECS) were used as the primary means of assessing the viability of target occurrences. These SPECS were developed in a global context and are based on a knowledge of historic evidence and current status, and include threshold values for assigning ranks (EORANKs) to target occurrences. As such, EORANKs provided a succinct assessment of predicted viability based on condition, size and landscape context (as discussed in the Conservancy's draft Element Occurrence Data Standard [The Nature Conservancy 1997]). They enabled a meaningful comparison of all occurrences of a given target across the ecoregion and throughout its range.

The element occurrence rank (EORANK) definitions are as follows:

A	=	excellent predicted viability
B	=	good predicted viability
C	=	fair predicted viability
D	=	probably not viable

For purposes of assessing target occurrence viability in the ecoregion, A-, B- and C-ranked occurrences were considered viable. However, because C-ranked occurrences are at the lower margin of viability, only A- and B-ranked occurrences were used to meet established ecoregional conservation goals (see Section 2.3.4 below). It was decided that the initial portfolio would be assembled with the best and most viable occurrences of each target possible. Non-viable (D-ranked) occurrences were considered to be non-viable and were not selected at any point in the portfolio selection process.

The use of EORANKs as indicators for community targets was especially problematical. Because the national community classification is new, EORANK SPECS were available for few (if any) community targets. Beyond this, the concept of community viability is largely unexplored. As a result, a method of assigning viability guidelines to community targets required development. To accomplish this, an approach developed by Mark Anderson of the Conservancy's Eastern Regional Office was utilized (Anderson 1997). Each community type occurring in the ecoregion was placed into one of three categories based on the standard scale at which it most commonly occurred across its range (i.e., matrix, large patch and small patch). The rationale behind this approach is that the natural process under which these communities evolved within the ecoregion is largely scale-dependent. The processes that maintain viable examples of matrix communities are largely similar within the group, but differ substantially from those of large-patch and small patch communities. In lieu of detailed target-specific EORANK SPECS, generalized conceptual specifications were used for each of these three size categories.

Once drafted, it was essential to apply these viability guidelines (in essence general EORANK SPECS) to community target occurrences. Because the new Conservancy data standards had yet to be released, there has been little opportunity by Heritage/CDC programs to consider ranking target occurrences along these guidelines. Rather, most were following the existing practice of ranking occurrences based on condition alone. This was especially true for communities, but also to a certain degree species. As such, assigned EORANKs did not adequately address the potential for long-term viability for a given target occurrence. Although it would have been preferable to apply EORANK SPECS to each occurrence in the ecoregional Heritage/CDC database, the large number of occurrences, immense time sink, lack of funds for this effort, and other associated factors made this endeavor impossible. Rather, as a means of obtaining this information in a cost-effective manner, Heritage/CDC and Conservancy staff were asked to use the SPECS as a guide to identify the best quality occurrences during the portfolio assembly meeting in April 1997.

2.3.4 Ecoregion Conservation Goals

Goals: Determination of the role the ecoregion plays in the long-term viability of a target species or natural community, and the number and geographic distribution of viable occurrences that must be protected within the ecoregion to sustain the target across its range.

Conservation goals set both the number and geographic distribution of viable occurrences required for the long-term viability of each target species and community, both across the full range of the target (Rangewide Conservation Goals) and within the ecoregion (Ecoregion Conservation Goals). Ecoregion goals were based on rangewide goals, and as such, required an assessment of the ecoregion relative to the rangewide distribution of each target.

The numerical portion of the ecoregion goal (number of occurrences) in general terms was based on the number of viable occurrences deemed necessary to ensure long-term viability of the target rangewide and the relative degree to which the ecoregion encompassed the full range of that target. For example, if it was determined that "10 viable occurrences evenly distributed across its range" would sustain the target over the long term, and the ecoregion encompassed 20 percent of the target's range or its documented occurrences, ecoregion conservation goals might call for 2 viable occurrences.

Maintaining genetic or compositional variability may be crucial for a target's long-term viability, particularly if climatic or other environmental changes occur. In order to capture the full array of this variability, conservation goals were drafted to describe the preferred spatial distribution of selected sites in the ecoregion. To guide this effort, an assessment of the genetic (species) and compositional (community) variability within each target across its range, the life history characteristics inherent within the targets, and the major ecological processes and patterns operating on them (e.g., fire, grazing, climate) was conducted. Because this information largely was not available, ecoregion sections or subsections used as a substitute for more detailed analyses. For community targets, general conservation goals were adopted for entire groups of targets.

All draft goals were sent for review to Heritage/CDC and Field Office staff within the ecoregion and other experts prior to discussion and adoption by the Northern Tallgrass Prairie Conservation Design Team. It is expected that conservation goals developed for these targets would be significantly improved upon in the future as additional information becomes available and conservation theory is improved.

Species

Species conservation goals (see Appendix 6) were derived from three principle sources:

- federal recovery plans;
- expert knowledge; and
- general scientific principles for long-term viability.

In many instances, conservation goals were derived from a combination of sources. When federal recovery plans were available for a given species, guidelines suggested therein were assessed and generally followed. For the most part, however, species conservation goals followed conservation theory suggested for some larger vertebrate animals (i.e., 10 occurrences of 200 individuals [Cox et al.

Table 1: A First Approximation of Ecoregional Terrestrial Community

Conservation Goals

PRIMARY TARGETS

Endemic   10 viable (A- or B-ranked) examples (stratified by subsection)
Limited   7 viable (A- or B-ranked) examples (stratified by section)
Widespread   4 viable (A- or B-ranked) examples (stratified by section)

SECONDARY TARGETS

Peripheral   Up to 2 viable (A- or B-ranked) examples (stratification not needed)

1994]). Because so little information was available for other taxa, the "10 x 200 Rule" generally was followed as a first approximation for setting rangewide conservation goals. Even though these general guidelines were developed for large vertebrate animals and were not intended to be applied blindly to all species, it did provide an approximation from which to derive a portfolio of sites. As conservation theory is enhanced and better, more sophisticated information becomes available for specific species or taxonomic groups, conservation goals will be revised and the portfolio will be modified to reflect these changes.

Natural Communities

Conservation goals for natural communities (Table 1, but also see Appendix 7 for specific target goals) were derived in a manner slightly different from species. The pattern of communities across the landscape is variable, and has been described as fitting either matrix, large-patch, or small-patch distribution patterns (Appendix 5). It has been suggested in at least one ecoregion that small patch communities may harbor a disproportionately large amount of the biodiversity in an ecoregion, whereas matrix communities play a disproportionately large role in defining structure and function (Anderson 1997). However, it remains unclear how these different roles should be used to establish ecoregional conservation goals more widely. Because of this uncertainty, matrix, large-patch and small-patch communities in the Northern Tallgrass Prairie were treated equally in terms of numbers of occurrences sought to meet ecoregional conservation goals.

The distribution of communities relative to the ecoregion is also variable. Four categories have been used to describe these distributions: endemic (restricted), limited, widespread and peripheral (Appendix 5). Distribution patterns have an obvious effect on conservation goals. If a community type is restricted to a particular ecoregion, all occurrences judged necessary to represent that type must come from that ecoregion. A type that is widespread could be protected in many different ecoregions, so any one ecoregion may need to protect only a portion of the occurrences required to represent the type. As such, the number of occurrences needed to protect each community in an ecoregion was scaled, based on the distribution pattern of the community type across ecoregions, with highest numbers needed for endemic community types and the lowest for peripheral types. Ultimately, specific goals will be established for each community type.

2.3.5 Site Identification

Goal: Identification of the suite of sites from which an ecoregional portfolio will be assembled.

Target occurrences were used to identify the suite of potential conservation sites in the ecoregion. It was from this entire pool of conservation sites (Figure 5) that an ecoregional portfolio (a subset of the former) was selected in the design stage. It would have been difficult to analyze conservation sites for biological significance or discuss them intelligently in the design stage without (at a minimum) an approximate delineation of their location and boundaries. Site size, in optimal circumstances, is determined by the habitat needs of the targets located therein. However, due to the highly fragmented nature of the Northern Tallgrass Prairie landscape, the size of sites in the ecoregion was more often determined by the size of remaining natural vegetation in an area. Site size varied considerably from the very small (< 100 acres; < 40 hectares) to the very large (thousands of acres or hectares).

For purposes of discussion, conservation sites in the Northern Tallgrass Prairie were broken into three size classes: small, medium and large. Target occurrences documented by Heritage/CDC programs served to identify small-scale sites and as such, are analogous to the survey and standard sites of Heritage and Conservancy terminology, respectively. These generally ranged up to 3,000 acres (1214 hectares) in size. Medium-scale sites (or macrosites) are amalgamations of survey/standard sites generally exceeding 3,000 acres (1214 hectares) in size. As such, their delineation was also based largely on Heritage/CDC inventory data. Large-scale sites (often termed landscapes) are large areas of untilled vegetation exceeding 25 square miles (65 km^2) in size and were identified via satellite TM imagery. Because their identification was based only on imagery and lacked comprehensive field verification, they have a more hypothetical relation to natural areas.

Once identification was complete, a digital ecoregional site coverage was compiled within a GIS environment. However, this coverage was completed for only the two larger site scales. Due to the large number of small-scale sites in the ecoregion (largely a result of the high degree of fragmentation), it would have been difficult and time-consuming to generate a comprehensive digital coverage of these. Instead, for purposes of identifying all targets occurring within a particular small-scale site, the SITENAME field in the EOR was used. These small-scale sites were then be linked to the larger-scale sites via a GIS.

Unlike small sites, boundaries of medium-scale sites were compiled into a digital GIS coverage. This coverage was formed through the digitization of boundaries from existing Heritage/CDC or Conservancy maps, or through existing digital inventory coverages already on hand. Because most sites had not been through a standard site conservation planning exercise, these boundaries were only considered as approximations. When maps or coverage were not available, rough boundaries were drawn to encompass the approximate locations and habitat needs of documented target occurrences, and subsequently digitized.

Untilled landscape identification in the Northern Tallgrass ecoregion was achieved via an analysis of satellite thematic mapper (TM) imagery with a ground resolution of 30 meters. In the U.S. portion of
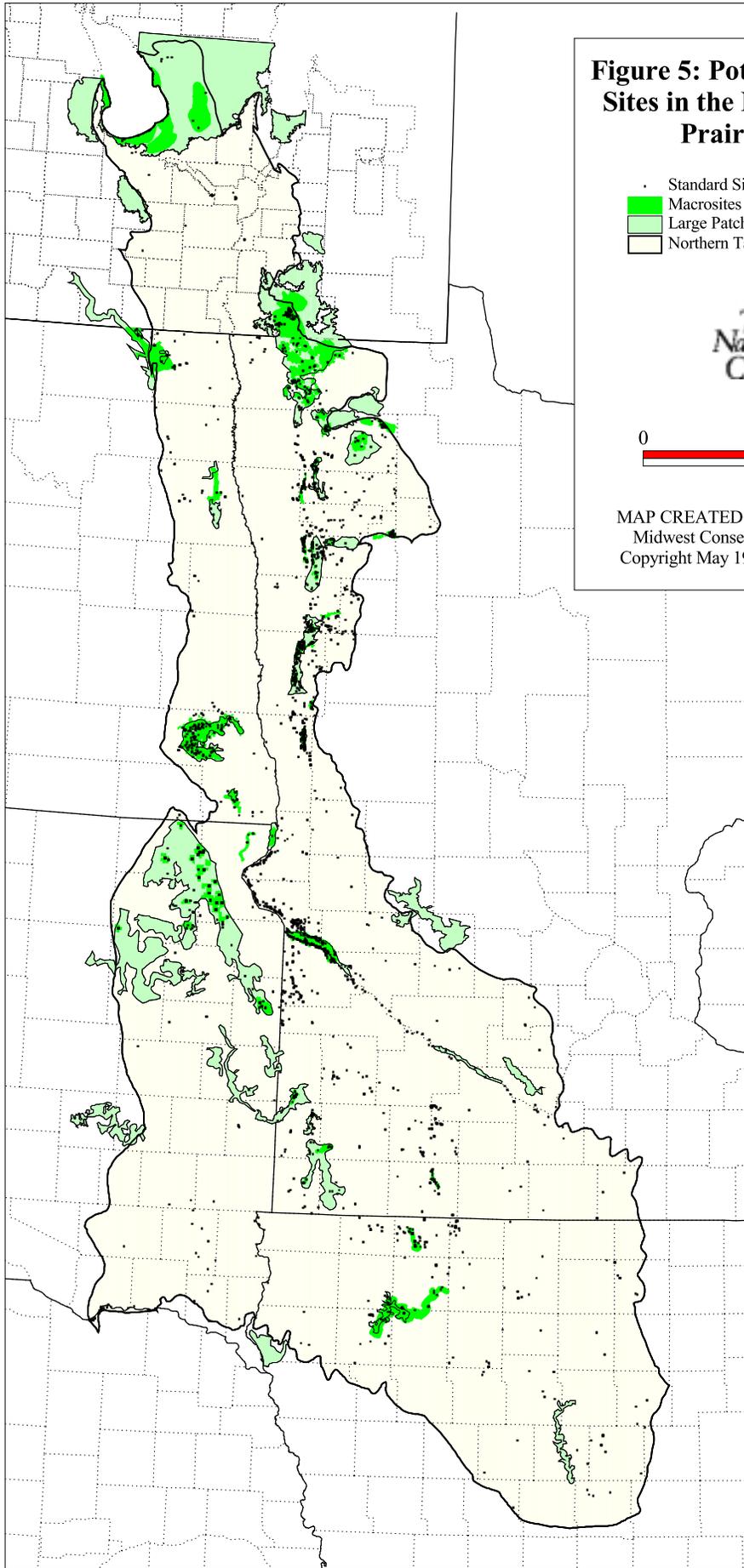
Figure 5: Potential Conservation Sites in the Northern Tallgrass Prairie Ecoregion

- Standard Sites
- Macrosites
- Large Patches of Unfragmented Vegetation
- Northern Tallgrass Prairie Ecoregion

The Nature Conservancy

0   50   100   Miles

MAP CREATED BY: The Nature Conservancy
Midwest Conservation Science Department
Copyright May 1998, The Nature Conservancy

the ecoregion, TM imagery was made available for pro bono use by the Conservancy through a cooperative relationship with the Multi-Resolution Land Characterization (MRLC) Consortium of federal agencies. Rectified digital TM images for the ecoregion (approximately 35 scenes in all) were displayed on screen in a GIS workstation environment to visually identify large patches of natural or semi-natural vegetation (untilled landscapes) exceeding 25 square miles (65 km^2) in size. Because of their relatively uniform spatial pattern, untilled landscapes were easily distinguishable from the mosaic-like appearance of the predominant agricultural backdrop.

Landscape boundaries were digitized on screen and later assembled into a georeferenced landscape polygon coverage. Landscape delineation took 3-4 days and was performed by Rick Schneider and Karen Poiani at EROS Data Center in Sioux Falls, South Dakota under a visiting scientist agreement. For the Canadian portion of the ecoregion, classified, hardcopy map output from TM imagery was purchased from the Manitoba Remote Sensing Centre in Winnipeg. Untilled landscapes were visually delineated and digitized from these maps. Together with those identified for the U.S. portion of the ecoregion, they were incorporated into a digital ecoregional coverage of untilled landscapes for use in portfolio analysis and design. The untilled landscapes were used in place of those identified through an experts approach (see Aldrich et al. 1997) for the Plains because it afforded a comprehensive look at the ecoregion, unbiased by the degree of inventory.

In areas where inventory has occurred, landscapes effectively serve to place documented target occurrences into context. Large, intact areas of vegetation (whether high quality natural communities or degraded examples) enhance the potential for the long-term viability of targets. These areas are critical to the viability of matrix communities and species that require large acreages. Large-scale processes are more likely to be maintained within large areas of natural vegetation than in highly modified systems, but even degraded systems (e.g., heavily impacted by grazing) with a predominant cover of non-native species retain some system integrity and serve to enhance the viability of targets over more fragmented systems. As such, these landscapes served as a preliminary baseline for large-scale, functioning systems in the ecoregion and as a result, yielded clues toward the potential for long-term viability of target occurrences. Because of this link to viability, landscape context is a major component in the assigning of EORANKs to target occurrences.

Thematic Mapper imagery analysis revealed 37 of these landscape patches, together encompassing 5,622 square miles (14,562 km^2) or roughly 8 percent of the Northern Tallgrass Prairie ecoregion. Rapid ecological assessments (REAs) of these landscape areas as conducted in other Great Plains ecoregions could have resulted in a more meaningful characterization of these landscapes, but these were not undertaken in the ecoregion during the course of this effort.

2.3.6   Managed Area Identification

Areas managed for conservation purposes are found throughout the Northern Tallgrass Prairie (in both the U.S. and Canada), most being publicly-owned lands. However, there is often great disparity between the degrees to which these areas offer long-term protection to biodiversity. As a component of ecoregional assessment, it was beneficial to identify those managed areas that offered some minimum level of long-term protection. Most useful as an electronic GIS coverage, this data layer (Figure 6) enabled a characterization of the level of conservation work already underway in portfolio sites, but will be most useful in the implementation of the ecoregional plan during site conservation planning.
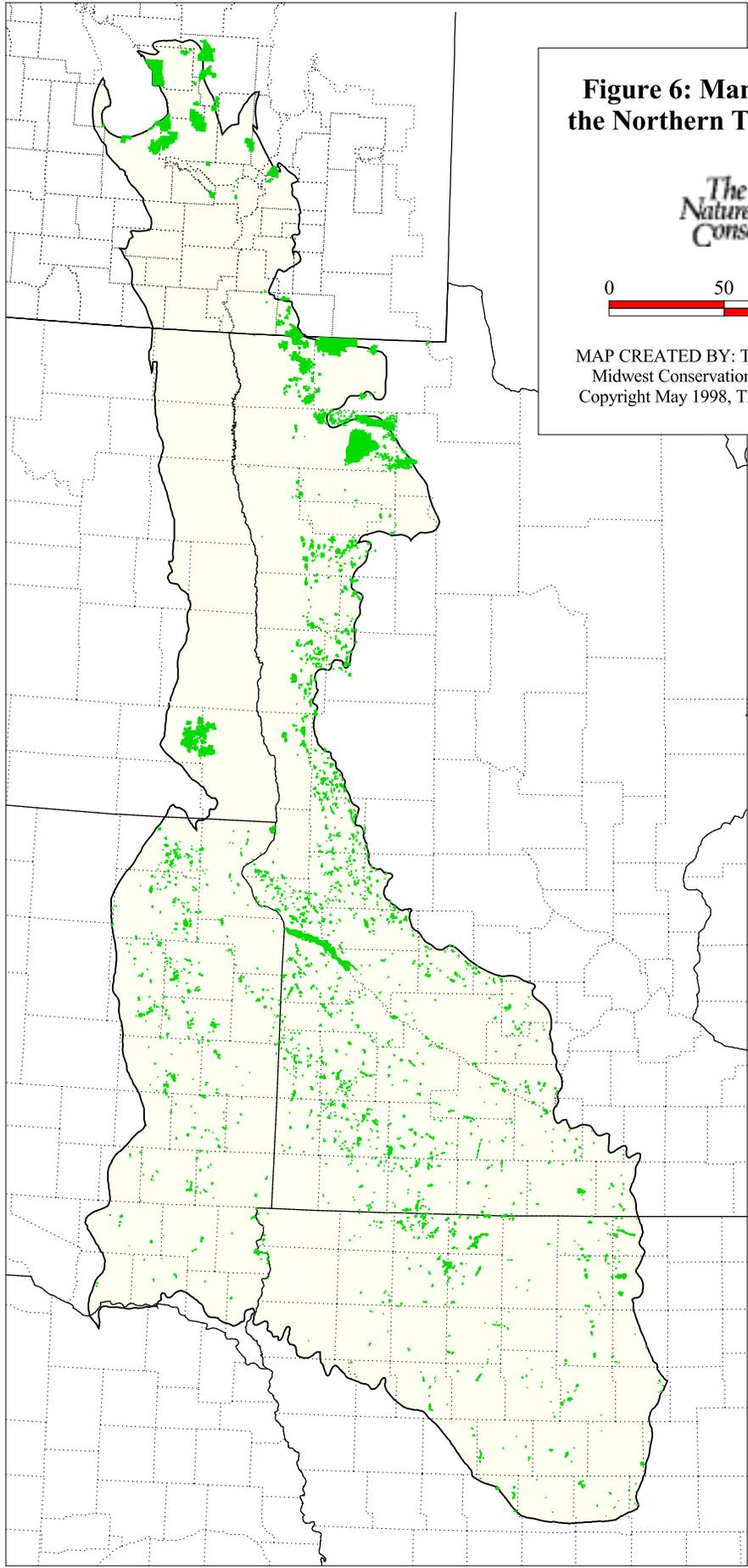
Figure 6: Managed Areas in the Northern Tallgrass Prairie

The
Nature
Conservancy.

0   50   100   Miles

MAP CREATED BY: The Nature Conservancy
Midwest Conservation Science Department
Copyright May 1998, The Nature Conservancy

A cooperative agreement with the U.S. Fish and Wildlife Service enabled the Conservancy to develop a managed area coverage for the eastern portion of the Northern Tallgrass Prairie ecoregion (Iowa and Minnesota). This effort utilized existing GIS managed area coverages, but also required an intensive effort of amassing site boundary maps for a large number of managed areas that had not been previously digitized. This data was augmented with managed area coverages (when available) from the remainder of the ecoregion. Complete managed area data was obtained from Manitoba. Managed area coverages from South Dakota were only available for state- and Conservancy-owned lands, while very minimal data was available for North Dakota. In total, 2,800 (level 1-3) managed areas were documented within the ecoregion.

2.3.7   Data Gap Documentation

One of the early conclusions of this effort was the reaffirmation that sound biodiversity data is a critical conservation tool. Ecoregional conservation cannot fully succeed if *all* targets are not adequately considered in the assessment and design stages. Data gaps preclude the optimal development and implementation of an ecoregional plan. However, the iterative nature of ecoregional planning will enable the Conservancy to identify, prioritize and fill critical data gaps within the ecoregion in a timely and planned manner. As such, each iteration of the planning process is subsequently strengthened. In addition, the process of identification, prioritization and filling of data gaps ultimately reinforces the critical linkage between the Conservancy's conservation work and the biological inventories of the Heritage/CDC Network. Documentation and prioritization of data gaps on an ecoregional scale serves to target funds toward filling critical data gaps and ultimately improving the ecoregional plan, while at the same time providing essential funding to Heritage/CDC programs.

As a preliminary step toward this end, data gaps identified throughout both the assessment and design stages of ecoregional planning in the Northern Tallgrass Prairie were compiled (see Section 4.6, and Appendices 6 and 7 for species and natural communities, respectively). These gaps will be prioritized for future action and an action plan developed for addressing them during the implementation stage of ecoregional planning.

Chapter 3:

The Ecoregional Portfolio Design

3.1   Background

The design stage of ecoregional planning in the Northern Tallgrass Prairie used the information compiled in the assessment stage to assemble a portfolio of conservation sites that would achieve the Conservancy's ecoregional conservation goal. Inherent within this stage was the development of a site selection methodology that would fill the portfolio in a scientifically sound but efficient manner. An ecoregional action plan that details ecoregional strategies for conservation action, the prioritization and filling of data gaps and so forth occurred in the later implementation stage.

This chapter discusses the assembly process developed for the Northern Tallgrass Prairie ecoregion and resulting portfolio. The assembly process was drafted by the Ecoregion Assessment Team and dispersed to members of the Conservation Design Team for review. With minor modifications, it was adopted by the Conservation Design Team at the ecoregional portfolio design meeting in April 1997. Methodologies as described in this chapter are not necessarily fixed, but likely will require modifications in the future as new information becomes available and scientific models yield additional insights into conservation strategies.

3.1.1   Team History

A Conservation Design Team composed of Conservancy and Heritage/CDC staff was formally organized for the Northern Tallgrass Prairie ecoregion in February 1997. Team members are listed in Appendix 8. Prior to that time (November 18-19, 1996), a subset of the eventual Design Team from the northern portion of the ecoregion met at the Conservancy's Midwest Regional Office to discuss potential ecoregion design and site selection scenarios. The results of that meeting were instrumental in aiding the development of the final site selection procedures. On April 3-4,1997, the complete Design Team met to assemble an ecoregional portfolio of conservation sites. Further discussion and modifications to the portfolio occurred after that date. Additional action to better incorporate aquatic species, aquatic communities and birds is now underway or will follow in the near future.

The primary objective of the Conservation Design Team was to use the information gathered or developed by the Assessment Team to assemble a portfolio of conservation sites that would meet conservation goals established for each target, effectively identifying where conservation action should occur in the ecoregion.

3.2   Assembling the Portfolio of Sites

Conservation by Design: A Framework for Success (The Nature Conservancy 1996a) laid out general guidelines for the assembly of ecoregional portfolios. These guidelines stressed the following attributes of a valid ecoregional assembly process:

- **Viability:** The target occurrences for which a site is selected for the portfolio can be maintained over the long term. Ecological processes are largely intact or restorable.
- **Biodiversity Value:** The site to be included in the portfolio has high quality occurrences of conservation targets.
- **Efficiency of Action:** The site has multiple viable examples of conservation targets.

✎ **Complementarity:** The site captures targets which have not been adequately incorporated into the portfolio.

Utilizing these parameters, the Northern Tallgrass Prairie Assessment Team drafted a framework for assembling an ecoregional portfolio of conservation sites. This assembly framework (outlined below) was subsequently approved by the ecoregional Design Team. A discussion of this process relating to the guidelines listed above follows in Section 3.2.3. Review of the draft portfolio to address multi-site strategies for the abatement of threats, the feasibility to conduct conservation action at portfolio sites, and a prioritization of the portfolio for conservation action (among others) followed after the selection process (see Chapter 4). As in the assessment stage, data gaps were identified and recorded for future consideration.

3.2.1   The Assembly Framework

Perhaps the greatest challenge to developing a portfolio of conservation sites in the Northern Tallgrass Prairie was to ensure that target occurrences selected to meet conservation goals were likely to remain viable over the long term. In essence, was their condition, size, and context within the landscape of sufficient quality to sustain them indefinitely?

As mentioned previously, the biodiversity of the Northern Tallgrass Prairie ecoregion was intricately tied to the natural processes with which it evolved (e.g., fire, grazing, climate). Because long-term viability is tied to these large-scale processes, a portfolio assembly process with a weighted focus on *ecological context* was developed for the ecoregion (see Section 3.2.2). Ecological context was factored into this assembly process in two ways:

1) Target occurrences with excellent and good predicted viability (EORANKs of A or B) were incorporated into the portfolio before lesser-viable examples. Because a primary factor in ranking occurrences is landscape context, target occurrences within a good landscape context were likely to be incorporated before those in poorer settings.

2) The portfolio selection sequence placed emphasis on natural communities (selecting occurrences of communities before species), and within natural communities on types which dominated the landscape (selecting occurrences of matrix before those of large patch or small patch types). Sites of sufficient size to sustain viable examples of matrix communities are inherently larger and likely to encompass viable examples of large and small patch communities and most species.

Inherent within this assembly process are two assumptions related to the viability of target occurrences which are of note:

1) *Long-term viability potential for a given target occurrence increases with the size of the natural area within which it is imbedded.*

    This assumption should hold true (as a general rule) for all targets, whether natural communities or species. Processes that maintain the viability of natural communities and species in the Plains operate at a multitude of different scales, from the very small to the extensive. Many of the primary evolutionary forces that shaped biodiversity in the Great Plains (e.g., fire, grazing and climate) operated at very large scales. The larger the natural areas within a site, the better the chances of capturing or restoring the full array of natural ecological processes and enhancing

long-term viability. Larger sites also have a better chance of capturing species and ecological processes of which we know little about (e.g., invertebrates, nutrient cycling).

2) *The long-term benefits (i.e., target occurrence viability) derived from ecological context continue to accrue at progressively larger sites even after minimum viability requirements have been met for a given target occurrence.*

   Ecological benefits as a result of context are additive relative to scale. At some very large scale, the additional benefits of increasing site size are likely to be negligible, but sites of that scale are no longer extant within the Northern Tallgrass Prairie.

No process for assembling an ecoregional portfolio is perfect. Even with the best model, redundancy and cost effectiveness are trade-offs and necessitate choices geared toward one or the other. It was felt that the selection process designed for the Northern Tallgrass Prairie (as outlined below) allowed for a focus on and beyond the natural community and species targets, to the ecoregion's inherent ecological systems as a whole. Additionally, because the process enhanced the likelihood of nesting smaller sites within larger ones (as a result of the selection sequence), it was felt that it would lead to enhanced efficiency over the long term. Importantly, it was also flexible, which allowed for modifications throughout the selection process.

Although the site selection process detailed here was tailored specifically for the Northern Tallgrass Prairie (a highly-fragmented grassland system with detailed biological data relative to other ecoregions in the Plains), the assembly procedures lend themselves to other Great Plains ecoregions. Modifications to this portfolio design resulting from inadequate inventory information, insufficient funding, or the relative intact nature of a given ecoregion may be necessary.

3.2.2   Assembly Sequence and Rationale

What follows is a discussion of the approach to portfolio assembly in the Northern Tallgrass Prairie. Although the process is laid out in a very linear fashion, it is done so merely to aid in understanding the process. Ecoregional planning is inherently a non-linear process.

The Four Rounds of Portfolio Assembly

As designed, the portfolio assembly process for the Northern Tallgrass Prairie ecoregion portfolio included four distinct rounds of selection and refinement (Figure 7):

✎ **Round 1:** Selection of Primary Target Occurrences with Excellent-Good Predicted Viability Potential (EORANK A or B)

   The assembly process was designed to give selection priority to high-quality occurrences of conservation targets. This served to equalize the playing field between targets by assuring that all selections of A- and B-ranked occurrences (for all primary targets) were made before any lesser quality (C-ranked) occurrences were incorporated into the portfolio.

Figure 7: Portfolio Assembly Sequence

High Quality Occurrences of Primary Targets	Fair Quality Occurrences of Primary Targets	Secondary Targets	Portfolio Revision
Matrix Communities	Matrix Communities	Matrix Communities	
↓	↓	↓	
Large Patch Communities	Large Patch Communities	Large Patch Communities	Conservation Design Review
↓	↓	↓	→ Final Ecoregion Conservation Design (Iteration 1)
Small Patch Communities	Small Patch Communities	Small Patch Communities	
↓	↓	↓	
Species	Species	Species	

Also, selection priority was given to primary targets, those which were especially critical to conserve within the ecoregion.

✎ Round 2: Selection of Primary Target Occurrences with Fair Viability Potential (EORANK C)

Due to the highly fragmented nature of the ecoregion, it was imperative that a process be developed to capture lesser quality occurrences if no high quality examples remained or were lacking in portions of the ecoregion where examples were required to meet the distributional requirements of conservation goals. Although target occurrences of fair quality were not used to satisfy conservation goals, their presence in the portfolio would effectively serve as a "life raft." Through proper management and restoration, the viability of these occurrences may be enhanced (i.e., rank improved to A or B). Upon completion of this round, a draft ecoregional design for all primary targets was completed.

✎ Round 3: Assessment of the Portfolio and Selection of Secondary Target Occurrences

The adequacy of the coarse filter in capturing the full array of common species is a largely untested assumption. Therefore, it was imperative that the draft portfolio be assessed as to whether it captured sufficient populations of the more common species and peripheral community types to ensure their long-term viability. These secondary targets included an assemblage of species characteristic of the ecoregion, common species in significant decline, species with large habitat needs and communities largely peripheral to the ecoregion. If deemed insufficient, additional sites could be selected to meet the needs of these species.

> ✎ **Round 4:** Reassessment and Critical Review of the Portfolio Design

> A final assessment and critical review of the draft ecoregion portfolio design by Design Team members allowed for modifications based on scientific rationale and feasibility analyses.

Selection within Rounds

Within each of the first three rounds, selection of target occurrences for the portfolio were addressed in the following group sequence: matrix community, large patch community, small patch community and species (i.e., selections were made for all matrix community targets before any selections were made for large patch, small patch or species targets). Within each category, site selection proceeded from the highest globally-ranked target to the lowest.

> ✎ **Matrix Communities:** Matrix communities were the characteristic vegetation types of the ecoregion. They historically covered vast acreages and are dependent upon large-scale processes now perhaps found only at the largest sites in the ecoregion (if at all). As a result, viable sites selected for these targets are likely to be the largest in the portfolio. The long-term viability of all targets is enhanced within large-scale functioning systems.

> ✎ **Large Patch Communities:** Large patch community viability is heightened within large landscapes. However, viable sites for large patch communities (even if not within a landscape setting) retain some level of system functionality that enhances the viability of small patch communities and many species that may be found within them.

> ✎ **Small Patch Communities:** Small patch community viability is enhanced within larger systems (i.e., sites identified for matrix and large patch communities); however, small patch community viability requirements also may be met at sites too small for large patch and matrix types.

> ✎ **Species:** Species are dependent upon the community types within which they occur, although from a natural community standpoint these may range from being high-quality to degraded. Irrespective of this, species occurrence viability is contingent upon the same natural processes (or those mimicked by humans) under which communities evolved.

3.2.3 Meeting the Conservancy's Guidelines

The portfolio assembly process developed for the Northern Tallgrass Prairie ecoregion was designed to meet the guidelines established in <u>Conservation by Design</u>. A synopsis of the assembly process with respect to each of the four issues identified in Section 3.2 (i.e., viability, biodiversity value, urgency of action, and complementarity) follows.

Viability

As discussed previously, viability was perhaps the driving factor which shaped the framework of the portfolio assembly process. Viability was addressed at two levels - the target (i.e., species or natural community type) and the target occurrence.

Target: Prior to portfolio assembly, an assessment was made to determine the number of viable occurrences required to sustain each target across its full range and within the ecoregion (i.e., conservation goals). These goals set the number of occurrences to be selected for the portfolio. Sites selected to meet these goals considered geographical spread as a surrogate for target genetic and compositional variability.

In order to better assure viability of a target species or community, only the most viable examples (A- and B-ranked occurrences) were selected to meet ecoregional conservation goals. Occurrences of fair quality (EORANK C) were incorporated into the portfolio in the absence of higher ranking occurrences, but were not used to meet conservation goals established for a given target.

Target Occurrence: Preference was given to target occurrences that were likely to remain viable over the long term as suggested by EORANKs (i.e., considering occurrence condition, size and landscape context).

Biodiversity Value

Target occurrences of excellent or good quality were selected before lesser quality examples (and as a result, sites with high-quality target occurrences were selected before those with only fair-quality occurrences). Also, the selection process favored the selection of large before small sites. Large sites are likely to contain more high-quality target occurrences than smaller sites.

Efficiency of Action

The portfolio assembly sequence was weighted toward natural community types that historically covered large geographic areas of the ecoregion (i.e., matrix communities). Viable examples of matrix communities occupy large areas and are more likely to capture viable examples of species and other natural community targets requiring smaller areas than approaches that treat targets equally (see Section 3.2.2).

An ecoregional scorecard (along with in-house knowledge of sites by the participants at the portfolio assembly meeting) was instrumental in selecting the best available occurrences (and ultimately sites) to meet target ecoregional conservation goals. All possible selections to meet the conservation goals were made for each target prior to moving on to the next. If uncertainty existed about the quality of a given occurrence relative to others in the ecoregion (both documented and undocumented), it was not considered for the portfolio.

Complementarity

Ongoing tabulation of target occurrences captured within selected sites occurred throughout the assembly process. This was a critical step in assuring efficiency in the portfolio and as a gauge in meeting established conservation goals.

As a site was selected to meet the ecoregional conservation goals for a given target, viable occurrences of other targets swept into the portfolio as the result of that selection were assessed and discussed for consideration of entry into the portfolio. A running log of target occurrences incorporated into the portfolio (both intentionally selected and swept in through other selections) was kept as a means of assessing progress towards meeting target conservation goals. With this information in hand, it was possible to weigh possible selection decisions prior to incorporation into the portfolio.

3.3   The Resulting Portfolio Design

On April 3-4, 1997, the Northern Tallgrass Prairie Conservation Design Team met to assemble the Northern Tallgrass Prairie portfolio design. This preliminary design was modified many times during the course of the next few months during a period of review. The resulting portfolio will serve as the blueprint from which conservation action will be undertaken within the ecoregion until the next iteration is completed.

The preliminary portfolio design for the Northern Tallgrass Prairie ecoregion originally consisted of 84 selected sites. However, once assembled, an assessment of the portfolio was undertaken by Design Team members to determine if sites in close proximity to each other should be merged or linked for conservation planning purposes. Two designations were suggested:

- Landscapes would be formed from selected sites if the targets for which they were selected or the natural processes that sustained them were dependent upon these nearby sites, and they were connected by areas of intact (predominately natural) vegetation to form large-sized areas.

- Linked sites would be formed if the selected sites were in close proximity to each other and targets for which the sites were selected were dependent upon these nearby sites, but natural vegetation between them largely converted to other uses.

After final review, the resulting portfolio consisted of 66 "conservation areas" (i.e., sites, linked sites and landscapes) (Figure 8). This reduction in the total number of conservation sites reflected the merging of 8 portfolio sites to form the Tallgrass Aspen Parkland landscape, and 6 conservation areas formed by the linking of sites (e.g., Mahnomen Prairies [2 sites], New Solum-Excel [2 sites], Pembina Beach Ridges Prairies [7 sites], Rothsay Prairie [2 sites], Twin Valley Prairie [2 sites], and Spring Grove-Summit-Scarlet Fawn [2 sites]). See Appendix 9 for a list of sites composing each conservation area listed above.

3.3.1   Meeting Target Conservation Goals

Although the Northern Tallgrass Prairie is fairly well inventoried, incomplete data for specific targets or geographic areas of the ecoregion resulted in an inability to meet ecoregional conservation goals for the majority of targets. The lack of comprehensive data was especially pronounced for natural communities. Of the 98 terrestrial community types found in the ecoregion, conservation goals were met for only nine

(9.2%). Additionally, only 130 of the total 362 selections (35.9%) to meet all community target conservation goals were filled by site selections. It also should be mentioned here that the absence of an aquatic community classification hindered their incorporation into the ecoregional portfolio. As such, no aquatic community selections were made.

Species data were more widely available and complete. Of the 25 target species for which ecoregion conservation goals called for the selection of sites, goals were met for four (i.e., prairie bush clover, prairie moonwort, Frenchman's Bluff moonwort and regal fritillary). However, 43 of the total 72 selections (59.7%) to meet all species conservation goals were filled in this iteration of the design stage. It is important to note here that because of taxonomic or identification issues, ecoregional conservation goals have yet to be set for 2 target species.

When A- and B-ranked occurrences were lacking within specific portions of the ecoregion to meet a given target's distributional requirements, lesser-quality C-ranked occurrences sometimes were added to the portfolio. These selected occurrences represent the best examples remaining within a specific portion of the ecoregion; through active management and restoration, it may be possible to upgrade their quality over time. Forty-two C-ranked target occurrences were added to the Northern Tallgrass Prairie portfolio - 24 for communities, 9 for plants, 6 for insects and 3 for birds. However, only 17 of these selections resulted in the addition of a new site to the portfolio. The remainder occurred within previously selected sites. For a list of sites selected for each conservation target, see Appendix 6 (species) and 7 (terrestrial communities).

A subset of the overall assembly results, portfolio selections for 9 conservation targets (both species and communities) were plotted relative to the ecoregional subsections of the Northern Tallgrass Prairie (see Figures 9-11). The Northern Mesic Tallgrass Prairie community type is one of this subset. Eight A- or B-ranked selections of were made toward meeting the ecoregional conservation goal of 10 viable examples (Figure 9); these are scattered over five of the nine subsections. In lieu of higher quality examples, 3 C-ranked selections in three subsections were incorporated into the portfolio in the southern portion of the ecoregion. An additional 4 A- or B-ranked occurrences were also swept into the portfolio, but because of their close proximity to other selected occurrences of similar quality were not considered for meeting the target's conservation goal.

3.3.2   Conservation Area Size and Ecological Context

Portfolio conservation areas ranged in size from the immense Tallgrass Aspen Parkland, Minnesota/Manitoba (699 square miles; 1810 km^2) and Sheyenne Delta, North Dakota (369 square miles; 956 km^2) to the relatively tiny Stinson Prairie, Iowa at 0.05 square miles (0.13 km^2) or 32 acres (13 hectares) (see Figure 8 and Appendix 13). The average size for a conservation area in the ecoregion was 21,787 acres (8,817 hectares) or 34 square miles (88 km^2). This number, however, was influenced heavily by a number of very large landscape-scale conservation areas in the portfolio. The median size site in the portfolio was 2,300 acres (931 hectares), perhaps a more representative indication of the relative size range of portfolio conservation areas.

Together, the 66 portfolio conservation areas encompass 2,247 square miles (5,820 km^2) or approximately 3 percent of the total land area of the ecoregion. Although this percentage may be perceived as far too small to meet the ecoregional goal of offering long-term viability to all species and

Figure 8: Northern Tallgrass Prairie Portfolio Design

■ Sites
▢ Linked Sites

The Nature Conservancy

0   50   100 Miles

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Midwest Conservation Science Department
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1 = Agassiz Dunes	34 = Mehurin 12 and 13
2 = Agassiz NWR	35 = Moose River
3 = Anderson Prairie - Crimm Savanna	36 = Morton Outcrop
4 = Antelope Hills North and South	37 = New Maine
5 = Aurora Prairie	38 = New Solum - Excel
6 = Barnesville	39 = Pembina Beach Ridges Prairies
7 = Blue Mounds	40 = Pembina Hills
8 = Bluestem Prairie	41 = Pembina Prairie WPA
9 = Bonanza Prairie SNA	42 = Pilot Knob State Preserve
10 = Chanarambie Creek Valley	43 = Pipestone National Monument
11 = Chester Hills	44 = Prairie Coteau SNA
12 = Cottonwood River Prairies	45 = Prairie WMA-WPA and Schellberg Prairie
13 = Crystal Springs	46 = Red Rock Prairie
14 = Delta Marsh	47 = Rosewood
15 = Des Moines River Valley	48 = Rothsay Prairies
16 = Dolliver Memorial State Park	49 = Saline Prairie
17 = Excelsior Fen Complex	50 = Shaokatan 31
18 = Faith Prairie	51 = Sheyenne Delta
19 = Felton Prairie	52 = Shoal Lakes
20 = Frenchmans Bluff	53 = Sica Hollow
21 = Gitchie Manitou	54 = Sioux Prairie
22 = Goose Lake Parkland	55 = Spring Grove - Summit - Scarlet Fawn
23 = Great Bend Prairies	56 = Steele Prairie State Preserve
24 = Gully Fens	57 = Stinson Prairie State Preserve
25 = Hankinson	58 = Swedes Forest
26 = Hoffman Prairie State Preserve	59 = Tallgrass Aspen Parklands
27 = Hole-in-the-Mountain	60 = Turtle River SP
28 = Kalsow Prairie State Preserve	61 = Twin Valley Prairies
29 = Kirchner Prairie	62 = Upper Minnesota River Valley
30 = Ledges State Park	63 = Walls 7 and Windsor 26
31 = Little Sioux River, Lower	64 = Waubay NWR
32 = Little Sioux River, Upper	65 = Waubun Prairies and Fens
33 = Mahnomen Prairies	66 = Woodlands-Lake Francis
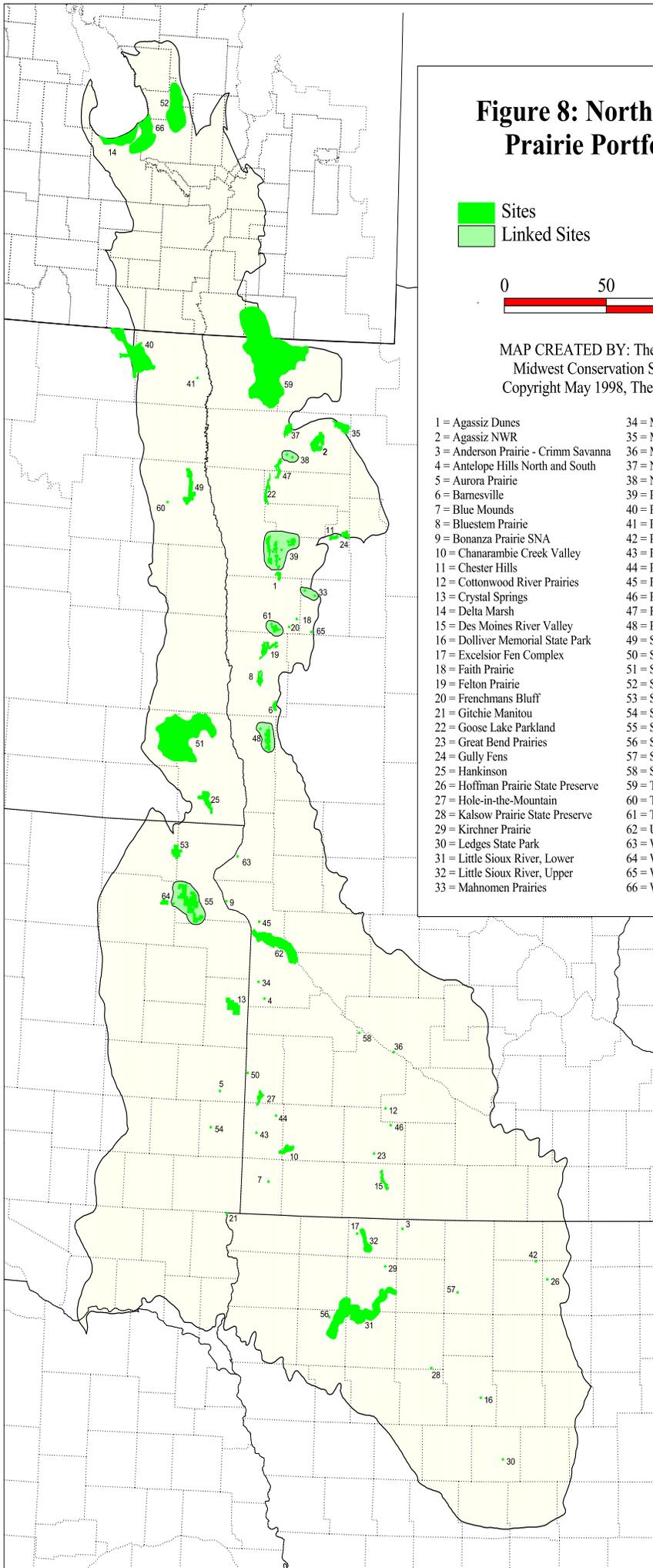
Figure 9: Conservation Goal Status for Select Communities in the Northern Tallgrass Prairie Ecoregion

Northern Mesic Tallgrass Prairie
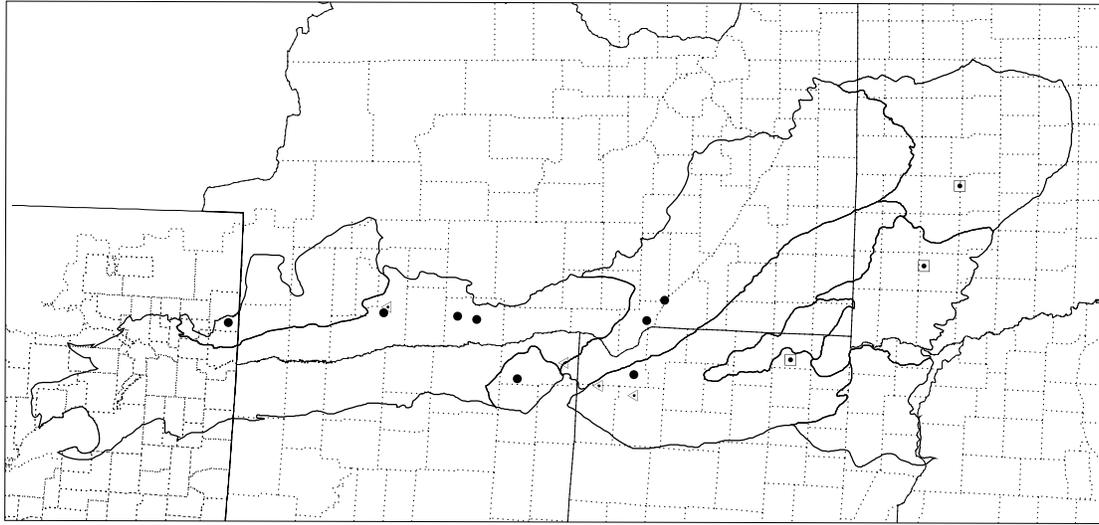
Little Bluestem - Porcupine Grass
Dry-Mesic Hill Prairie

Northern Cordgrass Wet Prairie

- ● Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
- ▣ Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
- △ Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

MAP CREATED BY: The Nature Conservancy, Midwest Conservation Science Department, Copyright May 1998, The Nature Conservancy.
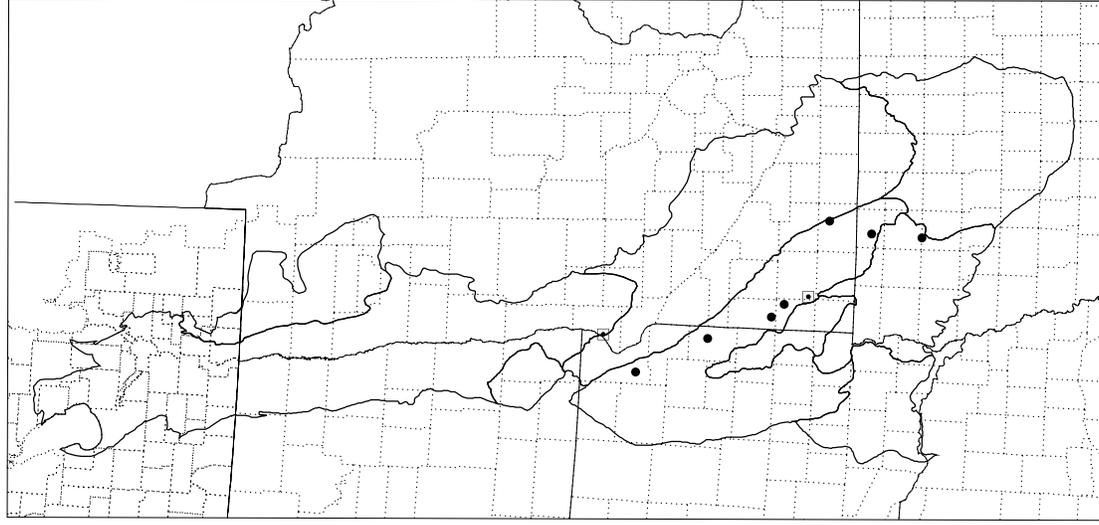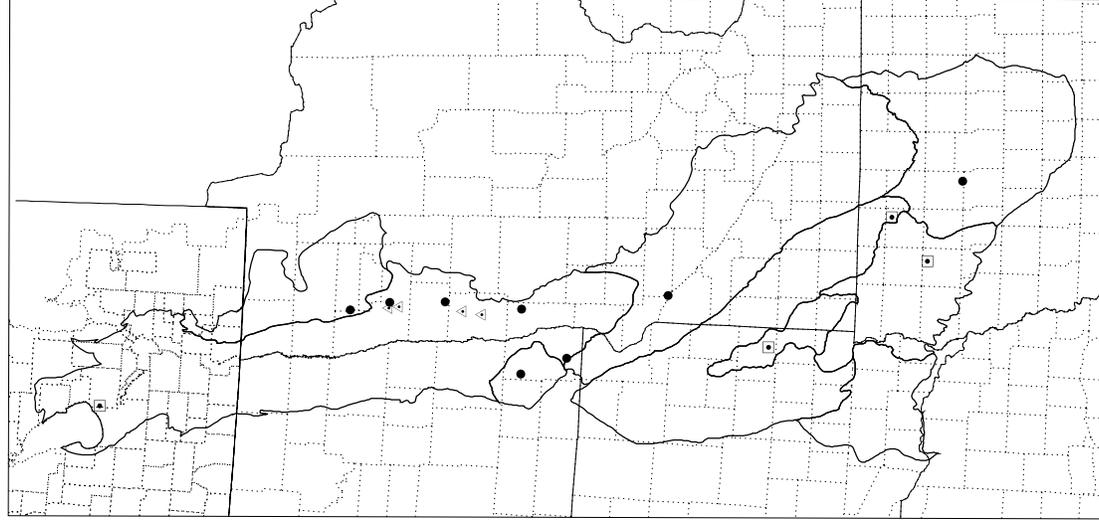
Figure 10: Conservation Goal Status for Select Communities in the Northern Tallgrass Prairie Ecoregion

Aspen - Oak Brush Prairie
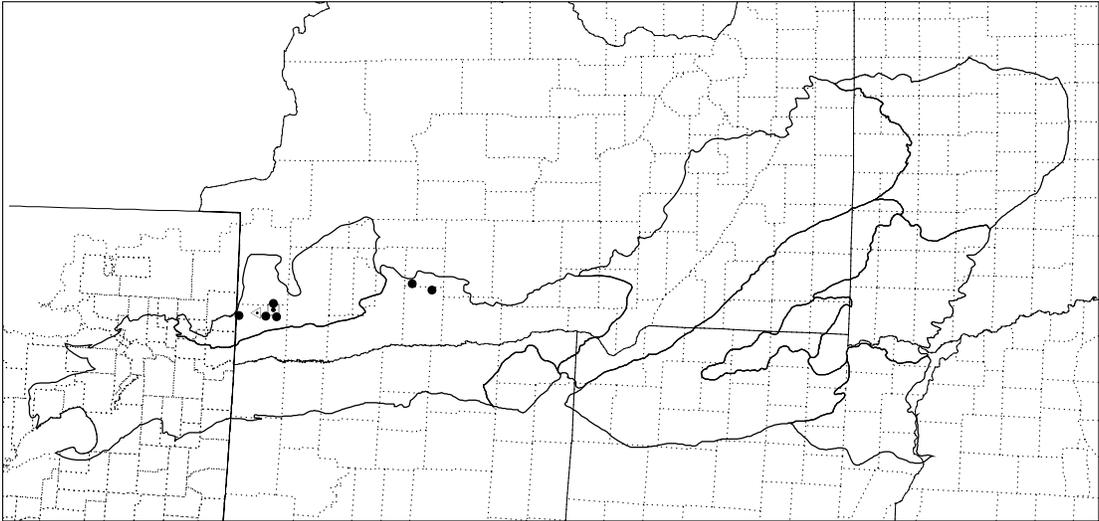
Great Plains Calcareous Fen

Saline Wet Meadow

● Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
▣ Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
△ Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

MAP CREATED BY: The Nature Conservancy, Midwest Conservation Science Department, Copyright May 1998, The Nature Conservancy.
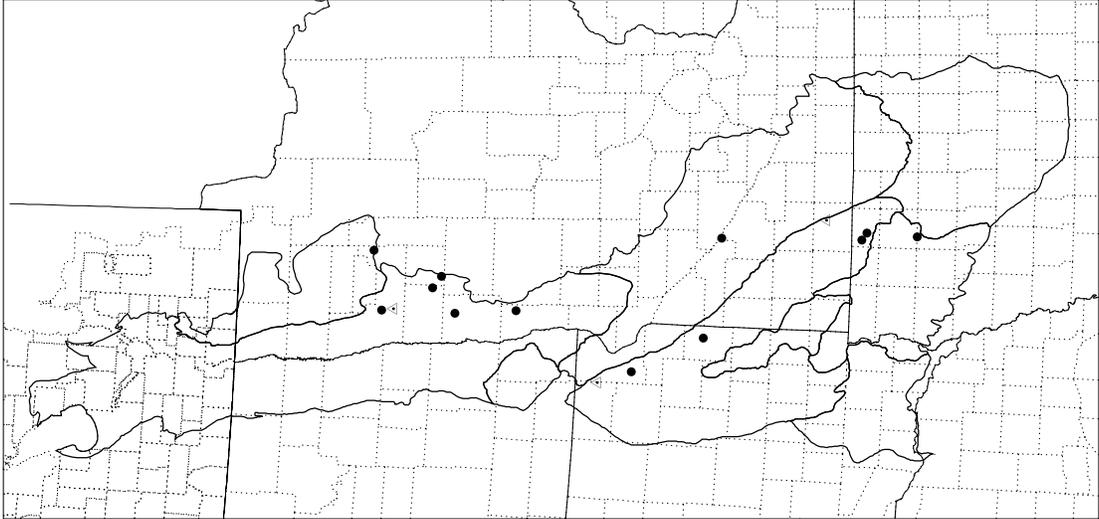
Figure 11: Conservation Goal Status for Select Species in the Northern Tallgrass Prairie Ecoregion

Western Prairie Fringed Orchid

Dakota Skipper

Poweshiek Skipperling

● Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
▣ Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
△ Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
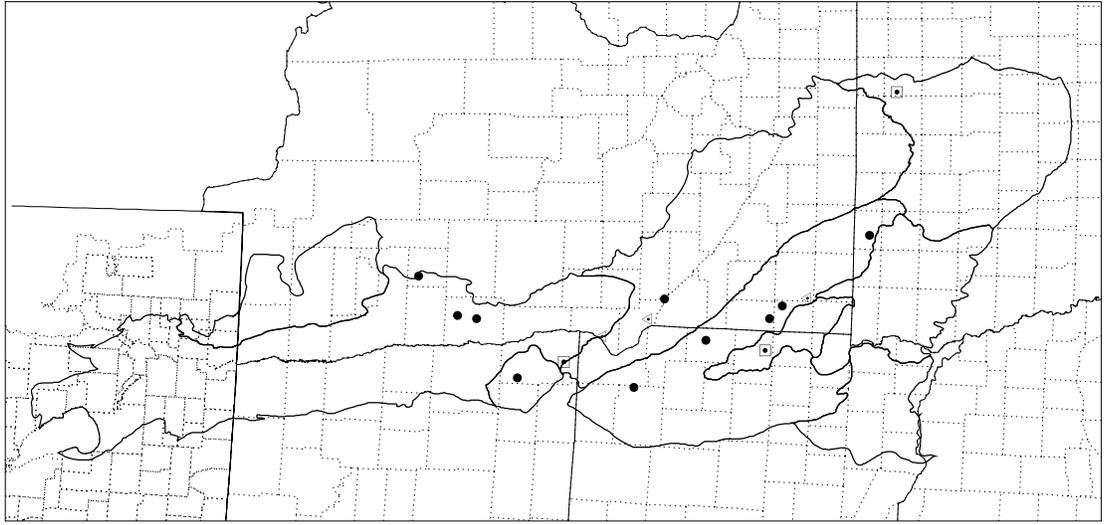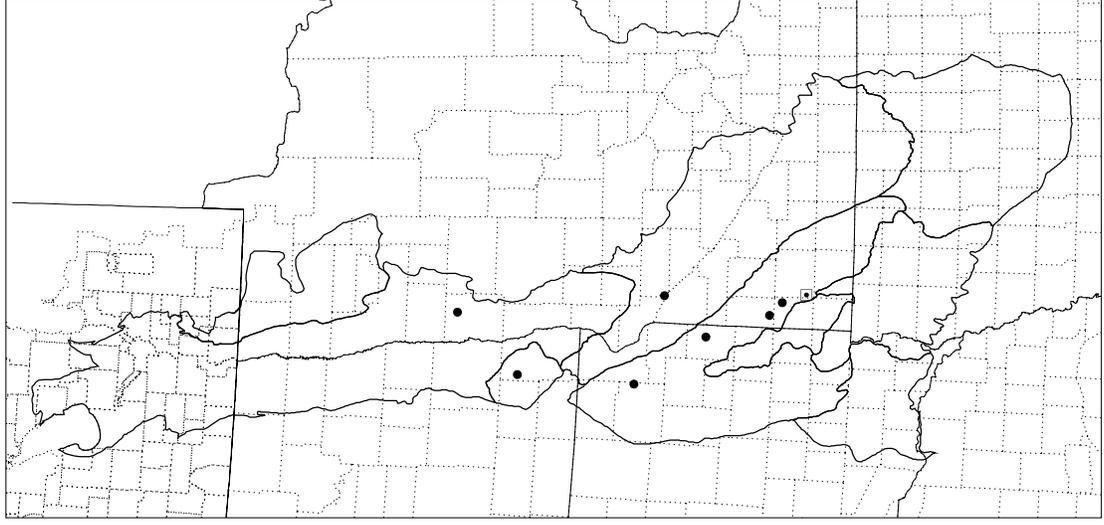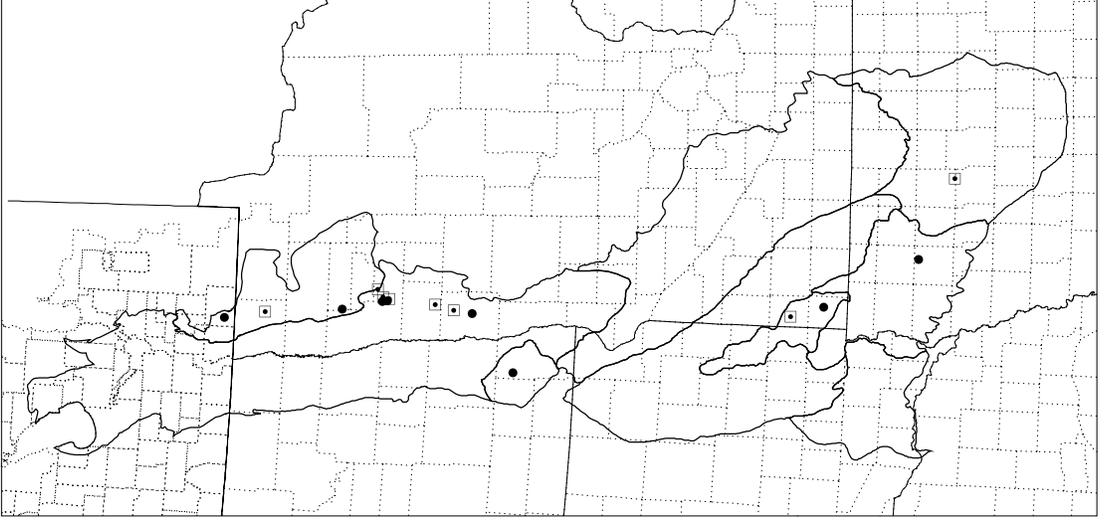
natural community types, it does reflect the realities of a highly fragmented ecoregion, an incomplete inventory, and the lack of addressing aquatic communities and birds. It has been estimated that less than 4 percent of the ecoregion remains in natural vegetation, so it is doubtful (without large-scale restoration) that the portfolio will amount to significantly more than that. As additional inventory data is compiled and the portfolio subsequently revised, the amount of land identified for conservation action will likely approach or surpass 4 percent.

As an indicator of long-term viability, the position of selected sites relative to large, relatively unfragmented blocks of vegetation (hereafter termed landscapes) is noteworthy.   These landscapes are more likely to maintain the large-scale processes under which many of the species and communities of the ecoregion evolved. In addition, they are more likely to maintain viable populations of species which have large area habitat requirements (e.g., prairie chickens, badgers) and as a result, a more complete associated fauna. Analysis of the portfolio revealed that roughly half (46%) of all conservation areas occurred within these landscape areas. However, in terms of total area, nearly all (2,127 square miles [5,509 km^2] or 95% of the portfolio) are encompassed therein. This disparity is the result of (not surprisingly) the large conservation areas occurring within landscape areas, and conversely, the small conservation areas occurring as isolated fragments within an agricultural setting.

The occurrence of selected target occurrences relative to these landscape areas is also of note. Seventy percent of all A- and B-ranked target occurrences selected to meet ecoregion conservation goals are located within these areas (Table 2). However, occurrences of fair (C-ranked) quality selected for the portfolio were less likely to be located within these areas (52% of all C-ranked occurrences). This trend is not surprising, as landscape context is one of the three factors considered in assigning occurrence rank. Together, two-thirds (67%) of all occurrences selected for the portfolio occurred within landscapes.

Table 2: Selected Target Occurrences Relative to Landscapes

TARGET	A- AND B-RANKED SELECTIONS		C-RANKED SELECTIONS		TOTAL
	WITHIN LANDSCAPES	OUTSIDE LANDSCAPES	WITHIN LANDSCAPES	OUTSIDE LANDSCAPES	
COMMUNITIES	**92**	**38**	**11**	**13**	**154**
SPECIES	**29**	**14**	**11**	**7**	**61**
- Birds	0	0	3	0	3
- Fish	0	0	0	0	0
- Insects	20	2	3	3	28
- Mollusks	0	0	0	0	0
- Dicot Plants	0	6	0	1	7
- Monocot Plants	6	2	5	3	16
- Pteridophyte Plants	3	4	0	0	7
TOTAL	**121**	**52**	**22**	**20**	**215**

The percentage of both species and natural community targets encompassed within landscape areas was roughly equal (Table 2). Selected occurrences of excellent and high predicted viability (A- and B-ranked) for species (67%) and communities (71%) alike were predominantly within landscape areas. Even when occurrences of fair quality were added to the mix, target species and community occurrences within landscapes were roughly equal (67% for communities, 66% for species).

Analysis of the target species relative to landscapes showed some interesting trends (Table 2). Selected occurrences of insect targets (more than that of any other taxonomic group) were largely encompassed within landscapes (91% of all A- and B-ranked occurrences; 82% of all occurrences). This compares to 75% and 69%, respectively, for monocot (i.e., western prairie-fringed orchid) and 43% and 43% for pteridophyte plants. All occurrences of dicot plants (i.e., prairie bush-clover) were located outside landscapes. Although no A- and B-ranked occurrences were selected for bird targets, all three selected C-ranked occurrences fell within landscapes.

3.3.3   Efficiency of Design

One of the assumed attributes of the portfolio design process was that the selection sequence allowed for an efficient portfolio - one that did not incorporate an excessive number of viable target occurrences beyond those needed to meet the established conservation goals. Although a large number of portfolio target selections still remain to be filled, an early analysis does suggest that the selection process has been efficient to date.

A total of 215 target occurrences were selected to be incorporated into the portfolio. These included 173 A- and B-ranked occurrences that met viability standards for conservation goals, and an additional 42 C-ranked occurrences (which because of lower assumed viability were not selected to meet ecoregional conservation goals). Beyond these, 18 additional A- and B-ranked target occurrences not intentionally selected for the portfolio (10.4% of all A- and B-ranked occurrences in the portfolio) were also captured (see Appendices 6 and 7).

Although it is believed that the assembly process has been efficient, it is yet unknown how the results of this analysis will compare with those of other ecoregional plans now nearing completion. However, as target conservation goals get closer to filling in future iterations, it is likely that the number and percentage of extra A- and B-ranked occurrences not needed for portfolio goals will increase.

Chapter 4:

From Assembly to Implementation

Once the ecoregional portfolio had been assembled, it became necessary to pull together additional information and conduct assessments to guide conservation action. To this end, several assessments were completed, each of which is discussed within the context of this chapter:

- Threats to Biodiversity at Portfolio Conservation Areas,
- Multi-Site Strategies for the Abatement of Threats,
- Feasibility Assessment,
- Prioritization of the Portfolio for Conservation Action, and
- Managed Area Assessment.

4.1   Portfolio Threats Assessment

Successful implementation of the ecoregional plan will hinge on the ability of the Conservancy (and its partners) to develop strategies to abate existing and future threats to the biodiversity of the ecoregion. Depending on the circumstances, strategies for tackling these threats may be site-specific and implemented at individual sites, or may be more regional in scope and require implementation at broader levels. However, as a first step it was critical that the threats be identified and the severity each posed to the biodiversity of the ecoregion assessed.

To achieve this goal, Design Team members knowledgeable about the portfolio were asked to identify and rank the severity of all known threats to biodiversity at each conservation area (Appendix 10). Threat severity was scored into one of three categories (High, Medium or Low) based on the degree of negative impact a given threat poses to the biodiversity of a conservation area. Severity estimates were subsequently given a numerical score for use in analyses: High = 5 points, Medium = 3 points and Low = 1 point. From this data, several analyses were made.

4.1.1   Frequency of Occurrence

The first analysis of the threats data was to determine the frequency of occurrence of each threat across the full portfolio. An analysis of the threats data revealed that a small number of identified threats were pervasive across the full suite of portfolio conservation areas. Habitat fragmentation, loss of the fire regime, exotic species were each identified at more than 50 of the 66 conservation areas (Table 3). Because of their pervasive nature, it is these threats that likely would benefit from multi-site abatement strategies.

4.1.2   Severity of Threat

Although frequency was a useful tool in identifying the threats most pervasive across the portfolio, it was not useful in ranking threats for abatement action. To address this issue, two separate threat severity analyses were conducted using the numerical scores assigned to the varying levels of threat (see above).

Table 3: Northern Tallgrass Prairie Portfolio Threat Analysis

Threat	Score	Frequency	Mean	Index
Habitat Fragmentation	208	66	3.15	3.15
Loss of the Fire Regime	177	56	3.16	2.68
Exotic Species	168	58	2.90	2.55
Inappropriate Grazing	140	47	2.98	2.12
Other Hydrologic Change	103	42	2.45	1.56
Habitat Conversion: Agriculture	101	47	2.15	1.53
Pesticide Drift/Application	100	43	2.33	1.52
Habitat Conversion: Mining	85	39	2.18	1.29
Wetland Drainage	70	36	1.94	1.06
Habitat Conversion: Logging	38	21	1.81	0.58
Habitat Conversion: Other	32	10	3.20	0.48
Recreational Use	26	13	2.00	0.39
Mowing or Haying	7	3	2.33	0.11

Mean Threat Severity: Conservation Area

In this analysis, scores for a given threat were added across the entire portfolio, then divided by the frequency of occurrence to yield a mean severity score across the conservation areas in which the threat was present.

Results of this analysis identified three threats with mean severity scores of 3.0 or higher (i.e., posed a moderately severe threat to targets whenever they appeared): loss of the fire regime, habitat conversion (other) and habitat fragmentation. Two additional threats (exotic species and inappropriate grazing management) also scored highly. Although a fair number of these threats had frequent occurrence within the portfolio (i.e., loss of fire regime, habitat fragmentation, inappropriate grazing management, and exotic species), threats posed by habitat conversion (other) were relatively infrequent. Although this latter type does not pose ecoregion-wide threats to biodiversity, it may warrant special attention in specific regions or areas because of its severe impact whenever it occurs.

Threat Severity Index: Portfolio

In this analysis, scores for a given threat were added across the entire portfolio, then divided by the total number of portfolio conservation areas (66) to yield a threat severity score indexed across the full portfolio (threat severity index). This analysis delineated the threats which posed particularly severe problems across the full portfolio.

Results of this analysis revealed that across the full portfolio, habitat fragmentation, loss of fire regime and exotic species, were significantly elevated in severity over all other threats. These three also ranked highly in all other threat analyses, suggesting strongly that they pose the greatest risk to biodiversity across the portfolio (and likely the ecoregion) as a whole. As such, these are the three priority threats for which multi-site abatement strategies should be sought.

4.2   Multi-Site Strategies for the Abatement of Threats

Multi-site strategies offer a potential for enhanced effectiveness in conserving the biological resources of an ecoregion beyond traditional site-based efforts. These strategies may be employed to tackle threats that are particularly difficult to address individually at specific conservation areas. Perhaps more frequent, however, they may be employed to offer some level of blanket protection to the full portfolio (in both high and low priority conservation areas). Because the scale of conservation work required to successfully implement the Northern Tallgrass Prairie portfolio is daunting (perhaps too large for even the full array of conservation organizations and management agencies to undertake on a site-by-site basis), these multi-site strategies may be an efficient means of meeting the Conservancy's goals for biodiversity protection in the ecoregion.

To address this issue, Design Team members were asked to participate in a discussion of the threats to biodiversity in the ecoregion, specifically aimed at delineating the possible multi-site strategies that might assist in alleviating their impact. Although specific emphasis was placed on the three primary threats identified as posing the greatest threat to biodiversity in the ecoregion (i.e., habitat fragmentation, loss of fire regime and exotic species), all threats were discussed in this context. The results of this discussion appear in Appendix 11. Prioritization of these strategies for implementation will be discussed and incorporated within an action plan developed by the Implementation Team for the ecoregion portfolio design.

4.3 Feasibility Assessment

With the portfolio assembly complete, it became necessary to check the results from a conservation area perspective to determine if current circumstances made long-term conservation success at some areas impossible. Although EORANKs indicated (to a degree) the potential viability of a given target occurrence and non-viable ones eliminated from consideration, current and pending circumstances (not directly attributable to a given target occurrence) may not have been adequately addressed in that rank. As such, a feasibility assessment of the portfolio was warranted.

The Northern Tallgrass Prairie ecoregion Design Team was asked to assess the feasibility of conducting conservation action within each of the portfolio conservation areas. In essence, were there conservation areas in the portfolio that, due to an array of circumstances, might not be viable? None of the conservation areas were eliminated from the portfolio as being totally unfeasible. Site viability for target occurrences will be addressed in much greater depth during the site conservation planning process.

4.4 Site Prioritization for Conservation Action

All conservation areas in the portfolio are highly important toward meeting the Conservancy's conservation goal for the ecoregion. However, the urgency for conservation action at some areas is elevated above others due to current and imminent threats to the biodiversity therein. Also, some areas (relative to others) have a disproportionate number of conservation targets located within their boundaries. With the large number of conservation areas requiring action, a means of prioritizing where conservation action is most critical is necessary.

A common theme running through the ecoregional portfolio has been its concerted focus on biodiversity. Assembly of the ecoregion portfolio largely was based on the quality of the target occurrences, and not

on other factors (e.g., containment within existing managed areas). Similarly, portfolio prioritization largely was based on the merits of each site toward meeting the Conservancy's ecoregional goals. To this end, the portfolio prioritization of conservation areas in the Northern Tallgrass Prairie was based upon a two-part assessment of:

    ↘   the biodiversity value of portfolio conservation areas, and
    ↘   the urgency of threats to the biodiversity of these areas.

As such, the prioritization process did not consider an array of other potential ranking factors (e.g., the ability of the Conservancy to raise funds or identify partners). Although factors such as these do have value in detailing where the Conservancy might want to work, it was felt that (as a first cut) it was important to have a clear prioritization of the portfolio from a biodiversity standpoint.   The product of such a prioritization will be useful as a point of reference to the Conservancy and all partner conservation organizations and management agencies. Additional revision of this priority list for programmatic reasons is a necessary step that should occur in concert with the development of an action plan for the ecoregion.

4.4.1   The Prioritization Matrix

As envisioned for the Northern Tallgrass Prairie, prioritization of conservation areas was determined through a standard 3x4 matrix, with biodiversity value and threat urgency constituting the x- and y-axes, respectively. Priorities for conservation action would be determined by the placement within the matrix, giving equal weight to biodiversity value and urgency of threat (Figure 12).   The means of assessing each of these factors is discussed below.

Biodiversity Value

Biodiversity value for each portfolio conservation area was determined by two factors:

    ↘   the number of target occurrences (meeting ecoregional conservation goals) for which the conservation area was selected, and
    ↘   the irreplacibility of a conservation area for targets (e.g., the sole or best conservation area for an ecoregional endemic).

Of these, the primary factor in ranking conservation areas for biodiversity value was the number of target occurrences for which an area was selected. Irreplacibility was a modifier of this primary factor, together producing an overall biodiversity value rank.

The number of target occurrences for which a given portfolio conservation area was selected to meet conservation goals ranged from having a low biodiversity value of zero (i.e., included in the portfolio only because of C-ranked occurrences) at numerous areas, to a high of 19 (i.e., selected 19 times to

Figure 12: Conservation Area Prioritization Matrix
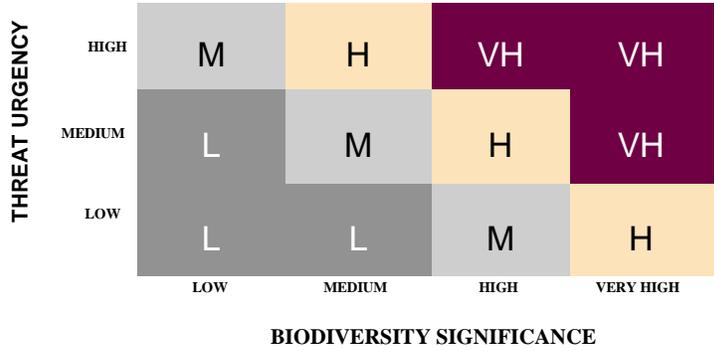
meet the conservation goals of targets) at the Tallgrass Aspen Parklands conservation area (Figure 13).
This information was used to preliminarily rank conservation areas into one of four categories: Very
High (identified to meet conservation goals through 10-19 selections), High (4-8 selections), Medium (2-
3 selections) or Low (0-1 selections). It should be stressed here, though, that all conservation areas in the
portfolio (by definition) are of high biological value, having already made it through a first screening
process.

Figure 13: Known Biodiversity Value Frequency Among Portfolio Conservation Areas
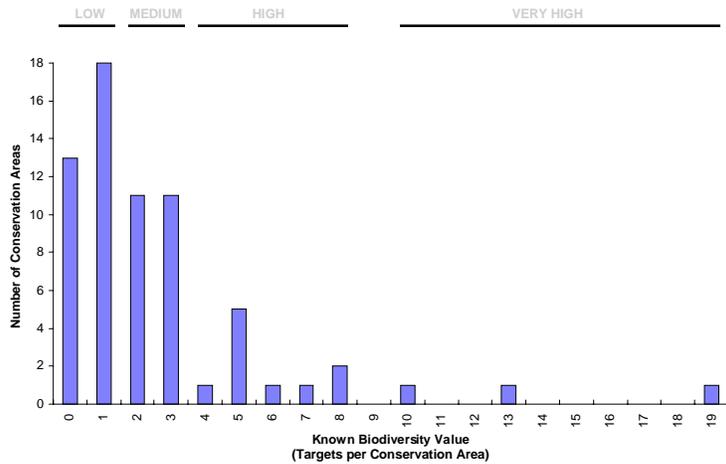
This preliminary rank was further modified by the factors of irreplacibility. If a conservation area possessed a single-site endemic, for example, it was elevated to a higher category (e.g., Frenchman's Bluff). Similarly, all targets which were endemic or largely restricted to the ecoregion were assessed to ensure that at least one of the conservation areas in which it occurred was highly ranked. If not, the conservation area with the best occurrence was elevated to a higher rank. The opposite rationale was also applied to ecoregion conservation areas. If areas were largely nominated for targets whose range was primarily peripheral to the ecoregion, its overall biodiversity value rank was lowered (e.g., Gully Fens). It should be pointed out, however, that in the case of Gully Fens, the unique juxtaposition of prairie and boreal communities may serve to elevate its biological significance within the ecoregion.

It should be stressed that the biodiversity value data used to rank conservation areas represents the current level of biodiversity knowledge in the ecoregion. A given area may actually have a far greater biodiversity value than is currently assigned, but because of insufficient inventory is not adequately represented here. The ranking of all conservation areas should be revisited in future iterations.


Urgency of Threats

Using threat severity information developed during the portfolio threats analysis (see Section 4.1.2), Design Team members knowledgeable about conservation areas within the portfolio were asked to assess the urgency at which conservation action was required within a given conservation area (i.e., at what time interval would the viability of the targets for which that area was selected be compromised). To address this issue, conservation areas were placed into one of three ranks based on the perceived urgency required to abate these threats: High (targets would be seriously degraded if no action occurred within 5 years), Medium (within 10 years), and Low (after 10 years). Results of this assessment revealed the following distribution within each of the three urgency categories: High (19 conservation areas), Medium (30 areas) and Low (17 areas).

4.4.2   Results: Conservation Priorities for the Northern Tallgrass Prairie

After all conservation areas were assessed for biodiversity value and urgency of threats, they were plotted within the 4x3 matrix to tentatively set priorities for conservation action in the ecoregion (Figure 14). This prioritization matrix identifies the number of sites falling within each priority level: Very High (6), High (12), Moderate (22), Low (26). All conservation areas are listed relative to the appropriate priority level in Appendix 12 and visually depicted in Figure 15.

As a general rule, conservation areas ranked as being of high or very high priority for conservation action are relatively large in size and occur within large landscape systems. In fact, 14 of 18 (5 of 6 very high and 9 of 12 high priority) conservation areas within these ranks fell within landscapes, speaking to the high potential for long-term viability of these areas. In terms of size, all but three of these areas exceeded 3,000 acres (1,214 hectares) in size.

The situation is very different at the other end of the spectrum, however. Of conservation areas ranked as moderate or low priority, only 16 of 48 were captured within landscapes. These groups also compose a significantly larger component of portfolio conservation areas less than 3,000 acres (1,214 hectares) in size. It should be noted, too, that the list of low and moderate priority conservation areas includes a number suspected of having heightened biodiversity value, but because of insufficient inventory have not been encompassed within higher priority ranks.

Figure 14: Conservation Areas by Priority

	LOW	MEDIUM	HIGH	VERY HIGH
HIGH	8	5	3	3
MEDIUM	11	12	7	0
LOW	10	5	2	0

THREAT URGENCY (vertical axis)

BIODIVERSITY SIGNIFICANCE
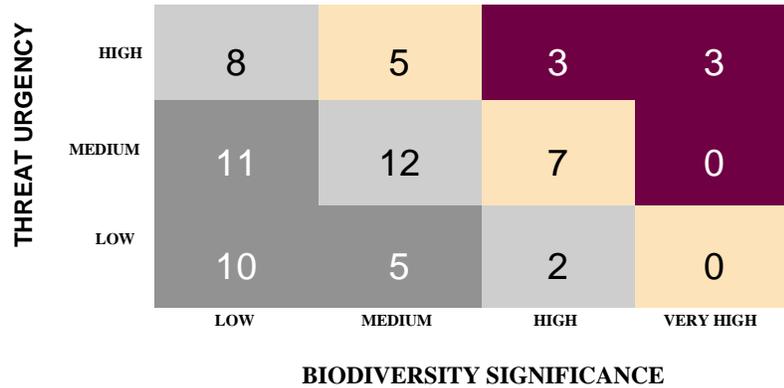
A word of caution is warranted here. Because of the near-total loss of tallgrass prairie from the ecoregion, it could be effectively argued that even the small remnant natural communities are essential for the long-term viability of biodiversity in the ecoregion, particularly in sections where only small remnants persist. Although not likely viable over the long term, these remnants functionally serve as a valuable genetic storehouse for restoration efforts. The argument that no more of the remaining natural communities in these sections can afford to be lost may be valid. Additional scientific guidance should be sought prior to the disbursement of any of these preserves.

4.5   Managed Areas Assessment

With the ecoregion portfolio design finalized and tentative priorities set among the portfolio conservation areas, a managed area assessment relative to the portfolio was in order. This assessment was conducted in order to identify potential partners and stakeholders within each of the respective conservation areas and across the portfolio as a whole. The resulting information could be used to:

- Determine what potential partners might take the lead for coordinating conservation activity within a given conservation area,
- Provide stakeholder information critical to site conservation planning, and
- Determine the level of current conservation action occurring at each conservation area.

The Northern Tallgrass Prairie boasts a long history of prairie conservation action, both in the United States and Canada. This is evident by the large acreage of portfolio lands currently under some level of active biodiversity management (i.e., Levels 1-3; see Table 4). The current Northern Tallgrass

Table 4: Managed Areas Classification

The following classification of protected areas (modified from Caicco et al. 1995) was used as an operational measure of a long-term commitment to the management of these areas for their biodiversity value. Although not specifically mentioned, areas with conservation easements may occupy levels 1-3 depending on the level of restrictions they impose.

Level 1: Highly Protected Managed Areas. An area maintained in its natural state with an active management plan. Natural disturbance events are allowed to proceed without interference or are mimicked through management activities. This level includes areas, such as those "dedicated" under appropriate statutes, which specifically prohibit removing the existing, strong, legal protection without obtaining the approval of higher levels of government and without following very specific procedures. Examples include: most national parks, Nature Conservancy preserves, some wilderness areas, Audubon Society preserves, some national wildlife refuges and Research Natural Areas.

Level 2: Moderately Protected Managed Areas. An area that is generally managed for its natural values but may receive use that degrades the quality of natural communities that are present. This level is for protected areas often allowing habitat manipulations for game species, song bird cover, etc. Examples include: most wilderness areas, national wildlife refuges managed for recreational uses, state wildlife management areas, federal waterfowl production areas, some state parks (those managed largely for their natural value) and Bureau of Land Management Areas of Critical Environmental Concern.

Level 3: Managed Areas of Low Protection. This level encompasses areas generally managed for consumptive or recreational values, but also which may maintain some natural value.   This includes most nondesignated public lands, including Forest Service, Bureau of Land Management and some state park lands (managed primarily or exclusively for recreational value). Legal mandates prevent permanent conversion to anthropogenic habitat types (with some exceptions, such as tree plantations) and confer some protection to populations of species federally listed as endangered or threatened and candidates for listing. Private land which have a signed management agreement with a public or private conservation agency/organization specifically addressing native species and natural community protection, are of this level.

Level 4: Areas with No Protection. All land in public or private ownership without an existing easement or management agreement that maintains native species and natural communities. These are managed primarily or exclusively for intensive human activity, including urban, residential and agricultural lands, public buildings and grounds, and transportation corridors. This also includes private lands that may or may not be managed for intensive human activity and may have significant biological value.

portfolio design totals nearly 1.5 million acres (600,000 hectares), of which nearly 370,000 acres (150,000 hectares) or 26% of the whole occur within managed areas (Figure 16).

Of the management agencies, state/provincial Departments of Natural Resources control the largest amount of land (178,000 acres [72,000 hectares]; 13% of the portfolio). This represents over half of all portfolio acreage currently under management (Figure 16). Significant holdings are also maintained by the U.S. Forest Service (71,000 acres [28,700 hectares], all within the Sheyenne National Grasslands), U.S. Fish and Wildlife Service (49,000 acres [19,800 hectares], within numerous waterfowl production areas and a small number of National Wildlife Refuges), federal Departments of Agriculture (46,000 acres [18,600 hectares], principally in Gardenton, Portage, and Woodlands Community Pastures) and on preserves managed by The Nature Conservancy (12,500 acres [5,000

Figure 15: Priority Map

Figure 15: Conservation Priorities for the Northern Tallgrass Prairie

Conservation Area Priority

- Very High
- High
- Medium
- Low
- Linked Sites

0   50   100   Miles

MAP CREATED BY: The Nature Conservancy
Midwest Conservation Science Department
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1 = Agassiz Dunes
2 = Agassiz NWR
3 = Anderson Prairie - Crimm Savanna
4 = Antelope Hills North and South
5 = Aurora Prairie
6 = Barnesville
7 = Blue Mounds
8 = Bluestem Prairie
9 = Bonanza Prairie SNA
10 = Chanarambie Creek Valley
11 = Chester Hills
12 = Cottonwood River Prairies
13 = Crystal Springs
14 = Delta Marsh
15 = Des Moines River Valley
16 = Dolliver Memorial State Park
17 = Excelsior Fen Complex
18 = Faith Prairie
19 = Felton Prairie
20 = Frenchmans Bluff
21 = Gitchie Manitou
22 = Goose Lake Parkland
23 = Great Bend Prairies
24 = Gully Fens
25 = Hankinson
26 = Hoffman Prairie State Preserve
27 = Hole-in-the-Mountain
28 = Kalsow Prairie State Preserve
29 = Kirchner Prairie
30 = Ledges State Park
31 = Little Sioux River, Lower
32 = Little Sioux River, Upper
33 = Mahnomen Prairies

34 = Mehurin 12 and 13
35 = Moose River
36 = Morton Outcrop
37 = New Maine
38 = New Solum - Excel
39 = Pembina Beach Ridges Prairies
40 = Pembina Hills
41 = Pembina Prairie WPA
42 = Pilot Knob State Preserve
43 = Pipestone National Monument
44 = Prairie Coteau SNA
45 = Prairie WMA-WPA and Schellberg Prairie
46 = Red Rock Prairie
47 = Rosewood
48 = Rothsay Prairies
49 = Saline Prairie
50 = Shaokatan 31
51 = Sheyenne Delta
52 = Shoal Lakes
53 = Sica Hollow
54 = Sioux Prairie
55 = Spring Grove - Summit - Scarlet Fawn
56 = Steele Prairie State Preserve
57 = Stinson Prairie State Preserve
58 = Swedes Forest
59 = Tallgrass Aspen Parklands
60 = Turtle River SP
61 = Twin Valley Prairies
62 = Upper Minnesota River Valley
63 = Walls 7 and Windsor 26
64 = Waubay NWR
65 = Waubun Prairies and Fens
66 = Woodlands-Lake Francis

Figure 16: Portfolio Lands by Ownership/Management Category

State/Province - Natural Resources (13%)

Federal - Fish and Wildlife Serivice (3%)
Federal - Forest Service (5%)
Private - Conservation Organization (1%)

Federal - Agriculture (3%)
Other Managed Areas (< 1%)

Private - Other (74%)

Table 5: Conservation Areas and Total Area Under Management by Management Agency

Management Agency or Organization	Conservation Areas	Total Area Acres/Hectares	
Federal - Provincial Farm Rehabilitation Agency	2	46,319	18,745
Federal - United States Fish and Wildlife Service	12	48,659	19,692
Federal - United States Forest Service	2	71,012	28,738
Federal - United States Park Service	1	284	115
Local - County Conservation Board	3	1,005	407
Private - Individual - Easement	3	1,663	673
Private - Organization - Conservation	17	17,074	6,910
Ducks Unlimited	1	1,920	777
Manitoba Naturalist Society	1	837	339
Nature Conservancy Canada	1	1,843	746
The Nature Conservancy	17	12,474	5,048
State/Province - Department of Natural Resources	41	178,218	72,123
State/Province - University or Other	2	3,251	1,316

hectares]) and a number of other organizations and agencies (together encompassing 10,500 acres [4,200 hectares]).

A second assessment of managed areas relative to the portfolio was undertaken to determine the number of conservation areas managed (at least in part) by a given management agency or conservation organization (Table 5). Again, state/provincial Departments of Natural Resources were found to manage lands at the largest number of portfolio conservation areas (41 conservation areas, 62% of the portfolio), far above the number managed by The Nature Conservancy (17 areas, 26%), U.S. Fish and Wildlife Service (12 areas, 18%) or any other management agency/organization. Twelve conservation areas (18% of the portfolio) have no managed areas located within them. For a list of managed areas by portfolio conservation area, refer to Appendix 13.

A third assessment was conducted to determine the degree to which portfolio lands within managed areas (levels 1-3) were being managed for biodiversity. Of all portfolio lands, only 2 percent were managed specifically for biodiversity (i.e., level 1), while 24 percent fell within managed areas where biodiversity was not the primary focus (i.e., levels 2-3) (Figure 17).

Figure 17: Portfolio Lands by Management Level

Level I
2%

Level II
12%

Level III
12%

Private and All
Others
74%
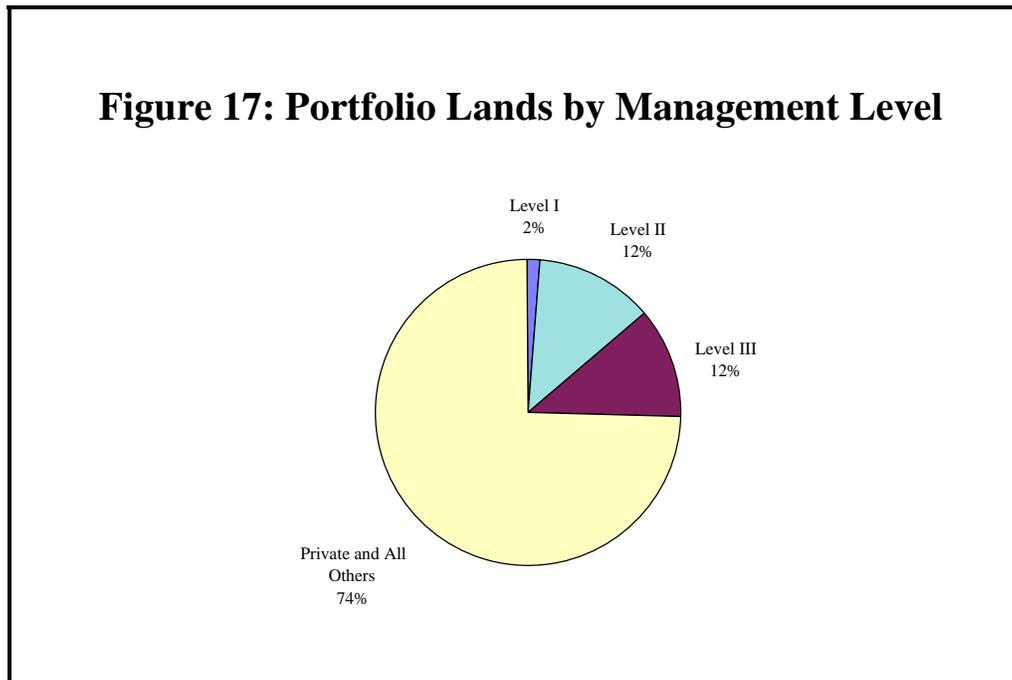
Although many state/provincial and federal agencies, and conservation organizations have focused on prairie conservation within the ecoregion for many years, the majority of portfolio lands (75%) still remain in private ownership. It is clear that successful implementation of the ecoregion design will be largely dependent upon the participation and support of private landowners.

Finally, an assessment was conducted to identify the degree to which past conservation action by the Conservancy was directed toward areas within the current portfolio of conservation areas. Although it would have been preferential to conduct this analysis on the full suite of areas impacted by the Conservancy's conservation work (both current preserves and cooperative projects), the unavailability

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Table 6: Conservancy Preserves Currently not in the Ecoregional Portfolio

Iowa

Ames High Prairie	Silvers-Smith Woods
Silver Lake Fen Addition	The Diggings

Minnesota

Blue Gentian Prairie	Nelson Wildlife Sanctuary
Foxhome Prairie	R & J Traeger Preserve
Glynn Prairie	Richard M. & Mathilda Rice Elliot SNA
Kettledrummer Prairie	Schaefer Prairie
Laible Woods	Staffanson Prairie
Lindgren - Traeger Bird Sanctuary	Wahpeton Prairie
Malmberg Prairie SNA	Western Prairie SNA
Margherita - Audubon Prairie	Zimmerman Prairie

South Dakota

Altamont Prairie	Vermillion Prairie
Makoce Washte Prairie	Wilson Savanna

</div>

of cooperative project data precluded this from being realized. As such, an assessment with respect to current Conservancy landholdings was undertaken.

Results of the analysis indicated that 25 of 45 preserves (56%) currently owned by the Conservancy within the Northern Tallgrass Prairie are not located within portfolio conservation areas (Table 6). Although it is likely that some of these preserves eventually may be linked to existing portfolio sites through site conservation planning (e.g., Margherita - Audubon Prairie linked to Bluestem Prairie) and others will be brought directly into the portfolio in future iterations, many may not be of sufficient quality. As such, it will be incumbent upon each state office to assess the strategic implications of maintaining these preserves within the current Conservancy portfolio.

4.6   Data Gaps

The lack of comprehensive data will always be an impediment toward reaching the ultimate goal of developing an ecoregional plan that ensures the long-term viability of all native species and natural communities. These data gaps were omnipresent throughout this planning process and have been placed into one of three different categories: geographical data gaps, conservation target data gaps, and gaps related to the ecoregional planning process, itself.

4.6.1   Geographical Data Gaps

Although the Northern Tallgrass Prairie is well inventoried relative to other Great Plains ecoregions, certain geographical portions are poorly inventoried.

Iowa

The state of Iowa has been inventoried fairly well over the years. Because of the near total loss of natural habitat in the state, the remaining natural areas have garnered a fair amount of attention. Still, additional contributions to the portfolio may come from the Northwest Iowa Plains subsection, an area largely unrepresented in the portfolio.

Manitoba

Relative to adjoining states in the ecoregion, Manitoba has been poorly inventoried. The one exception is the Tallgrass Aspen Parkland portion of the province near Tolstoi which is the center of a relatively high degree of prairie conservation activity. Beyond this, perhaps the area to lend the most significant contributions to the ecoregional portfolio lies at the north edge of the ecoregion within the Manitoba Interlake area. The southern shores of Lake Manitoba and areas adjacent to the Shoal Lakes contain significant prairie and aspen parkland habitat that are largely uninventoried.

Minnesota

Much of northwest Minnesota has been intensively inventoried by the Minnesota County Biological Survey (MCBS) during the past decade. However, southwest and south-central Minnesota are less well known. Additional inventories within the Minnesota River Valley (now underway by the MCBS) and the Prairie Coteau should yield significant natural areas warranting inclusion into the ecoregional portfolio.

North Dakota

The eastern edge of North Dakota has been relatively well inventoried over the past two decades. The job of inventory has been made relatively easy by the near total conversion of the Red River Valley to agriculture. Those areas remaining have been the focus of inventory efforts over the years.

South Dakota

Eastern South Dakota, as a general rule, has not been well inventoried (although areas of detailed inventory have occurred). This is changing rapidly, however, as the Prairie Coteau has been the focus of several natural community, insect and mollusk inventories in the past few years. It is the Prairie Coteau that has the highest potential for contributions to the ecoregional portfolio in South Dakota. The Yankton Hills and Valleys subsection has been entirely absent as a contributor to this exercise. Additional inventory is warranted there as well.

4.6.2 Conservation Target Data Gaps

Numerous data gaps for the ecoregional conservation targets were identified throughout the planning process, for both communities and species. These are detailed in Appendices 6 and 7. Beyond these (as mentioned previously in the text), data gaps are abundant for aquatic communities, birds and aquatic species. Also, the general lack of good, solid information about the secondary targets has made the effort of testing the validity of the coarse filter approach in this ecoregion inherently difficult.

4.6.3 Ecoregional Planning Process Information Gaps

Information gaps also plagued the planning effort from a process standpoint. For example, the general lack of species population viability data made it inherently difficult to set rangewide and ecoregional conservation goals. Similarly, the concept of community viability has not (in essence) been addressed at any level, making the task of determining occurrence viability and setting conservation goals troublesome.

These are but a tip of the iceberg in terms of process gaps encountered during the planning effort. Because this ecoregional planning process was one of the first to get underway, the whole exercise was literally one huge information gap that hindered progress and necessitated a concerted, intensive effort to overcome. This planning process did not resolve all of the issues and does not provide all of the answers, but it does serve as a template from which other ecoregional planning efforts around the Plains and the country can learn and modify to their own unique settings.

Chapter 5:

Conclusions and the Ecoregional Action Plan

5.1   Project Expenses

The final project expenses for ecoregional design in the Northern Tallgrass Prairie approximate $92,500. However, it should be noted that this is a projected estimate based on financial figures assessed in June 1997 (six months prior to completion of the project).

The resources to fund this effort were largely supplied by respective state and regional offices of The Nature Conservancy, along with considerable voluntary assistance by state/provincial Heritage/CDC programs. Additional funding for the development of a digital managed area coverage and a managed area biodiversity assessment was provided through a cooperative agreement with the U.S. Fish and Wildlife Service. A breakdown of incurred expenses is illustrated in Figure 18.

Figure 18: Project Expenses

Accrued by:

The Nature Conservancy

Existing Field Office and MRO/Great Plains Staff	$43,000
Ecoregional Planning Specialist	$24,000
Data	$ 5,500
Travel	$ 2,000

Heritage/CDC Programs

Data Management	$12,000
Travel	$ 5,000

Total: $92,500 U.S.

5.2   Lessons Learned

When ecoregion planning was initiated in the Northern Tallgrass Prairie, there were few examples to follow. The development of team structure, design process and strategies for ecoregional design was very much a first step for the organization. As such, numerous errant steps were made, each under the scrutiny of the assessment and design teams.

Throughout the ecoregional design process (especially at the conclusion of the portfolio assembly meeting), participants forwarded their thoughts and concerns about all aspects of the planning effort, including team structure, design process and strategies. This feedback will enable the Conservancy to improve on this design effort and learn from past experiences. Listed below are the lessons learned along

the way:

⊠ Team structure and the roles of team members were never discussed. There was never a full discussion of the role and expectations of field office and Heritage/CDC staff in the process. Without this discussion, there was no clear team leadership and, consequently, direction at the onset. Progress frequently stalled as team members were pulled away into other projects and no one was identified to push the project forward.

⊠ No budget, workplan or timeline was developed for the planning effort; as a result, insufficient financial resources plagued this effort from the beginning and progress often slowed to a crawl. The vast majority of effort was provided by Conservancy and Heritage/CDC staff. Aside from direct staff time, only minimal resources were identified for the project (some allocated by the Midwest Regional Office and others from outside sources). Financial support to Heritage/CDC programs would have facilitated greater participation in the process and attendance at meetings, and the completion of tasks in a more timely manner.

⊠ The ecoregional planning process in the Northern Tallgrass Prairie would have benefited from a more inclusive group of individuals at the onset. As stated previously, the team size was small and composed of individuals within the Midwest Regional and Minnesota Field Offices. No Heritage/CDC or other field office staff were initially involved, and were certainly not participants in the shaping and development of the project. An effort to bring these (and perhaps other) individuals into the process likely would have increased buy-in and participation in latter stages of the planning process and brought different perspectives to the effort.

⊠ Very few outside (non-Conservancy or Heritage/CDC) partners were brought into the planning process. It would have been advantageous to work closely with other conservation organizations and experts in order to answer critical questions and facilitate the later implementation of the ecoregional plan. An experts workshop (to rank occurrences of targets and address taxonomic or classification questions) held prior to the portfolio assembly meeting would have resulted in a more concise, effective meeting and enhanced the overall involvement of biological experts throughout the ecoregion.

⊠ The establishment of work teams within a broader assessment and design team effort may have effectively shared the workload among team members and facilitated the completion of the effort in a more timely manner. As it was, much of the work frequently fell on the same small group of individuals who were often involved in a wide array of other responsibilities.

⊠ The process could have benefited from more frequent communication, both verbal and written, with all persons involved. The lack of frequent communication made it sometimes difficult for people to participate actively, especially if supervisors had not been notified of expectations. This was especially problematic for Heritage/CDC staff.

⊠ New data standards (especially target occurrence ranking guidelines) being proposed by The Nature Conservancy helped significantly in this planning effort, and will undoubtedly do much to enhance the quality of future ecoregional design iterations. However, the standards will only be beneficial if all state and provincial Heritage/CDC programs implement them, resulting in a standardized data set. Reformatting existing data will undoubtedly be a major undertaking and a concerted effort to incorporate these data standards in respective Heritage/CDC programs is essential.

- In addition to upgraded data standards, ecoregional planning calls for data not previously compiled by many Natural Heritage/CDC Programs (e.g., secondary target species, shorebird concentration areas). Some of this data will have to be obtained from non-Heritage sources (e.g. experts workshops), but others could be compiled by Heritage Programs given adequate lead time. Future ecoregional planning efforts could benefit by a more formalized pre-planning assessment of available data and data needs. Decisions regarding the timeframe and expense of achieving some minimum data needs prior to initiation of the ecoregional planning effort could be made at that time.

- A Geographic Information System (GIS) proved to be critical to the site selection process of ecoregional design. It, along with a computer projector assembly to display the image on-screen, enabled a meaningful discussion of target occurrences, conservation sites and other data.

- Failures are often the greatest successes. Mistakes and subsequent revisions were numerous throughout this planning effort. For example, the first test of the site selection process (November 1996) designed for the ecoregion proved largely ineffective in yielding the intended results. However, out of that meeting came a clearer understanding of information that would prove critical to final development of a portfolio assembly methodology. These mistakes often lead to enhanced products down the road, but only if shared with others.

- If planned effectively, the portfolio assembly meeting can be used to inform Conservancy staff, chapter trustees, or other individuals on the design process. However, this will likely necessitate a pre-selection meeting (perhaps incorporating an experts workshop) to develop a prioritized list of occurrences for each conservation target. Without such a meeting (as was the case in the Northern Tallgrass Prairie), the selection process became laborious, often bogging down in scientific minutia.

- If ecoregional plans are to be completed in a timely manner, it is critical that the initiation of planning efforts be effectively coordinated. Based on experience gained in the Northern Tallgrass Prairie, it is likely that the ability of Heritage/CDC programs to respond effectively and participate in these efforts will decrease proportionately to the number of efforts currently underway in their state/province. Additionally, Conservancy staff also may feel the effects of an excessive number of ongoing efforts, diminishing productivity in other programmatic areas and significantly elevating weekly work hours. This could lead to burn-out and a lowered ability to answer requests in a timely manner.

- At the onset of ecoregional assessment, it seemed logical that an ecoregional design might be assembled around existing managed areas, augmenting those with additional sites. With that presumption, a large amount of time was spent pulling together a digital managed area coverage for the ecoregion. However, upon further thought, a decision was made by the ecoregional Assessment Team that an ecoregional portfolio of sites should be assembled on the basis of target occurrence quality (regardless of whether they were currently captured within existing managed areas). With that decision, managed areas became less central to the core development of an ecoregional design. Although the large amount of time invested in securing a managed area coverage could have been better spent elsewhere, the resulting product does have value, both as a means to conduct a managed area assessment of portfolio sites, and for use in site conservation planning during the later implementation stage.

- An early test of the portfolio design methodologies illustrated clearly the need to delineate a pool of sites (and their approximate boundaries) from which the portfolio would be selected. This delineation of site boundaries (ultimately completed for the landscape and macrosite scale sites) enabled a meaningful discussion of the sites and an assessment of the targets occurring within each. This delineation was also critical for analyses within the final report.

- It was essential to have people with experience and knowledge of the targets and conservation sites present on hand to prioritize occurrences, either in the context of an experts workshop or at the site selection meeting. It was their knowledge of these occurrences/sites that drove the entire selection process.

- At present, there is no institutional ability to track rangewide conservation goals set by ecoregional planning teams, or progress being made toward meeting those goals. It is currently difficult to know if all ecoregions within a the range of a given target are adequately considering it in their respective plans. Even if fully implemented, will ecoregional plans within the range of a given target adequately assure its long-term viability? This is becoming one of the key issues that requires resolution.

5.3 An Action Plan for the Northern Tallgrass Prairie

An ecoregional plan is only complete when it has addressed all targets in a comprehensive manner. Due to inherent data gaps and other reasons, a comprehensive design has not been achieved for the Northern Tallgrass Prairie ecoregion. Despite that fact, a credible first iteration has been achieved. With that in hand, a general action plan identifying and prioritizing the steps for implementing the current ecoregional plan and setting the stage for the next iteration planning process was developed. The details and timeframe of this action plan, however, have not been fully addressed, and now fall squarely upon the shoulders of the Northern Tallgrass Prairie ecoregion Implementation Team. Rob McKim (MNFO State Director) is the designated lead of the entire ecoregion planning process; Brian Winter (Northern Tallgrass Prairie Ecoregion Office) has been selected to serve as Implementation Team leader. It will be the responsibility of these two individuals to assemble the full Implementation Team and develop an action plan, timeline and budget to adequately address the numerous issues this ecoregional plan presents.

The following items compose the general action plan put forward by the ecoregion Design Team:

- Two major components of an ecoregional plan (birds and aquatics) were not sufficiently addressed in this first iteration of the Northern Tallgrass Prairie ecoregional design. Work teams need to be developed to address these short-comings, either in the near future or within the context of the second iteration. Currently, Kim Chapman (Minnesota Field Office) is spearheading an effort to incorporate the needs of birds into the ecoregion plan, and another effort is underway to explore the issue of bird conservation within the larger Great Plains. During 1998, a strategic action plan for addressing aquatic species and communities within the ecoregions of the Great Plains will be assembled.
- The prioritization of data gaps listed in this report and the development of a strategy to fill those priority needs is critical. Perhaps the most significant improvements in the ecoregional plan are likely to occur within the first few iterations of the ecoregional design as data gaps are targeted for inventory.

⬊ Discussions related to funding the successful implementation of the ecoregion design will be critical to its ultimate success. Interstate/international joint projects will likely require coordination and the sharing of staff, expertise and financial resources. Similarly, discussions centered on conducting conservation in an efficient, cost-effective manner throughout the ecoregion (much along the lines of existing cooperative projects like the Tri-state Stewardship Initiative and Northern Tallgrass Prairie office) will further enhance the Conservancy's effectiveness. A communication plan will be critical to the success of this endeavor.

⬊ There is a critical need to work cooperatively with an array of partners to fully realize this plan. Strategies for engaging partners in the implementation of the plan need to be developed and pursued.

⬊ A surprisingly large number of current Conservancy preserves are not integrated into the ecoregion design. Although this may in part be due to insufficient inventory and the lack of site conservation plans, a strategic plan for the assessment of these preserves and a strategic plan for their long-term management is warranted.

⬊ Before conservation action proceeds at a given site, it is essential to know what conservation strategies will be used to safeguard its biodiversity, and at which part of the site each strategy will be utilized. Site conservation planning is therefore an essential need. To address this need, decisions need to be made as to where site conservation planning is required, and at what intensity. Multiple levels of site conservation planning may be appropriate depending on our level of involvement in each of the portfolio sites.

⬊ It is imperative that the wheels of ecoregional planning in the Northern Tallgrass Prairie continue to turn. Although momentum within the Northern Tallgrass may slow as energy is diverted to other ecoregions, it is important that the Conservancy's conservation goal remains the primary focal point of our efforts. As such, a strategy to maintain this focus needs to be developed among the state and regional offices involved.

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Appendices

Appendix 1:

Archived Ecoregional Tabular and Spatial Data

Appendix 1: Archived Ecoregional Tabular and Spatial Data

The management of all tabular and spatial data for this project was accomplished using Microsoft Access in conjunction with ESRI ArcInfo and ArcView products. All data bases listed below are archived at The Nature Conservancy's Midwest Regional Office GIS Lab. A Northern Tallgrass Prairie ecoregion element occurrence data base will not be maintained or archived at the Regional Office; rather, a larger, more comprehensive set of element occurrence data for the Great Plains will be maintained through annual updates from respective Heritage/CDC programs in the region.

MS Access Data Bases (Tabular Data)

Conservation Target Data

TARGET COMMUNITIES
Basic information on the natural communities occurring in the ecoregion, including: alliance, formation, global name, synonym, global rank, patch-size (pattern), and ecoregion distribution. Utilized to produce Appendices 4, 7 and 9.

TARGET SPECIES
Basic information on the target species, including: global name, synonym, global rank, US endangered species act designation (USESA), and level of endemism relative to the ecoregion. Utilized to produce Appendices 2, 3, 6, and 9.

TARGET COMMUNITIES SUBSECTION DISTRIBUTION
Presence/absence of target communities in each of the ecoregional subsections, based on element occurrence record data and expert knowledge of ecologists. This data base was used primarily to aid in setting ecoregional conservation goals for each community type (number and spatial distribution).

TARGET SPECIES SUBSECTION DISTRIBUTION
Presence/absence of target species in each of the ecoregional subsections based on Heritage/CDC element occurrence record data. This data base was used primarily to aid in setting ecoregional conservation goals for each species target (number and spatial distribution).

TARGET CONSERVATION GOALS
Target rangewide and ecoregion conservation goals, comments, and documentation of data gaps. Utilized to produce Appendices 6 and 7.

Site/Conservation Area Data

ECOREGIONAL CONSERVATION SITES
Basic information on all conservation sites identified during the planning process, including: name, state/province, subsection, size, coordinate information, and distribution relative to landscapes of biological significance and large untilled landscapes (see below).

LANDSCAPES OF BIOLOGICAL SIGNIFICANCE

Name and size of expert-derived biologically-significant landscapes occurring in the ecoregion, as compiled by the Conservancy's Great Plains Program for *The Status of Biodiversity in the Great Plains.*

LARGE UNTILLED LANDSCAPES

Name and size of untilled landscapes larger than 25 square miles in size, as derived from visual analysis of satellite TM imagery.

Managed Areas Data

ECOREGIONAL MANAGED AREAS

Basic information on level 1-3 managed areas in the ecoregion, including: name, type, subsection, state/province, county, size, owner, protection level, and location within landscapes of biological significance, large untilled landscapes, and identified conservation sites. Used to produce Appendix 13.

CONSERVATION AREA MANAGED AREAS

The name and size (in acres) of managed areas located within each portfolio conservation area, as determined by GIS overlay and Design Team members. Used to produce Tables 5 and 6, and Appendix 13.

MANAGED AREA COMMUNITY ANALYSIS

A list of natural communities occurring within ecoregional managed areas. This data was compiled from an array of sources: Heritage/CDC Element Occurrence Records, published reports, habitat inventories, project evaluations, and personal communications with land managers. Much of this information has not been verified in the field.

Ecoregional Portfolio Design Data

PORTFOLIO SELECTIONS

A data base of conservation targets selected for the ecoregional portfolio by portfolio site. This data was useful in detailing a list of selected targets occurring at each site, and a list of sites for which a given target was selected. Revised EORANKs, supplied by Heritage/CDC ecologists, follow the 1997 Conservancy standard ranking guidelines (taking into account occurrence size, condition and landscape context) are included with this table and were used as an indicator of long-term viability. Used to produce Table 2 and Appendices 6, 7, and 9.

TARGET COMMUNITIES SWEEP ANALYSIS

An assessment of community occurrences captured by portfolio selections for other conservation targets, arranged by site. The data base includes relatively accurate revised element occurrence ranks, but they have not been critically reviewed by Heritage/CDC biologists. This data base was used to assess the relative efficiency of the selection process, and to determine if any target community occurrences swept into the portfolio through other selections could be used to meet ecoregional conservation goals.

TARGET SPECIES SWEEP ANALYSIS

An assessment of target species occurrences captured by portfolio selections for other conservation targets, arranged by site. The data base includes relatively accurate revised element occurrence ranks, but they have not been critically reviewed by Heritage/CDC biologists. This data base was

used to assess the relative efficiency of the selection process, and to determine if any target species occurrences swept into the portfolio through other selections could be used to meet ecoregional conservation goals.

PORTFOLIO CONSERVATION AREAS
Basic information on portfolio conservation areas (sites, linked sites and landscapes), including: name, type, state/province, subsection, size, coordinate information, and location within landscapes of biological significance and large untilled landscapes. Used to produce Table 2 and Appendices 6, 7, 9, 12, and 13.

PORTFOLIO THREATS ANALYSIS
Identification and severity ranking of all threats to biodiversity known to occur at each site in the portfolio. Rankings were supplied by Design Team members knowledgeable about respective areas. Used to produce Table 3 and Appendix 10.

CONSERVATION AREA PRIORITIZATION
Assigned values for Biodiversity Significance and Urgency of Threat for portfolio conservation areas. These values were used to assign a level of priority for conservation action to portfolio conservation areas. Used to produce Appendix 12.

MULTI-SITE THREAT ABATEMENT STRATEGIES
A list of possible multi-site strategies to alleviate the impact of ecoregional threats as identified by the ecoregional Design Team members. Used to produce Appendix 11.

Other Data
SUBSECTIONS
Size statistics for the subsections composing the ecoregion, as determined by GIS analysis.

ArcView Spatial Data

Political Boundaries
County Boundaries - includes Local Government Districts and Rural Municipalities for MB.
State and Province Boundaries
Minnesota Township Range
1994 US Census Tiger Line Data
   Landmark and water feature information for Becker, Beltrami, Big Stone, Blue Earth, Brown, Chippewa, Clay, Cottonwood, Douglas, Faribault, Freeborn, Grant, Jackson, Kandiyohi, Lac Qui Parle, Le Seuer, Lincoln, Lyon, Mahnomen, Marshall, Martin, McLeod, Meeker, Murray, Nicollet, Nobles, Norman, Otter Tail, Pennington, Pipestone, Polk, Pope, Red Lake, Redwood, Renville, Rock, Roseau, Sibley, Stevens, Swift, Traverse, Waseca, Watonwan, Wilkin, and Yellow Medicine counties.

Ecoregion Boundaries
Northern Tallgrass Prairie Ecoregion Boundary - modified version of the Conservancy ecoregion.
Ecoregion Section and Subsection Boundaries - from US Forest Service and Canada Soil Inventory.

Conservation Sites and Managed Areas
Managed Areas - comprehensive coverage for MN, IA, MB; State and Conservancy lands in SD;

Sheyenne Delta in ND.
Macrosites - conservation sites greater than 3000 acres.
Sheyenne Delta LANDSAT Image - Thematic Mapper (TM) Image from EROS Data Center.
Landscapes of Biological Significance - expert-derived identification of biologically-significant landscapes in the NTP.
Large Untilled Landscapes - areas of untilled land greater than 25 square miles as delineated from satellite TM imagery.

Ecoregion Portfolio Design
NTP Portfolio of Sites - small and medium-sized sites.
Conservation Sites - standard sites, linked sites, and landscapes.

Other Physical Features
Lakes - Digital Chart of the World water features with areas great enough to be depicted as polygons.
Streams - Digital Chart of the World single line streams not included in the lakes coverage.
Watersheds - USGS 8-digit hydrologic cataloging units (drainage basins).
Railroad - Digital Chart of the World railroad line types and status.
Roads - USGS Digital Line Graph data includes major transportation systems.
States - boundaries from the USGS Digital Line Graph data.

Appendix 2:

Primary Target Species in the Northern Tallgrass Prairie

Appendix 2: Primary Target Species in the Northern Tallgrass Prairie

Element Code	Scientific Name	Common Name	Global Rank	USESA	Level of Endemism
BIRDS					
ABNFC01010	*Pelecanus erythrorhynchos*	American White Pelican	G3		Mostly Outside
ABNNB03070	*Charadrius melodus*	Piping Plover	G3	LELT	Peripheral
ABNNM08102	*Sterna antillarum athalassos*	Interior Least Tern	G4T2Q	LENL	Peripheral
ABPBXA0010	*Ammodramus bairdii*	Baird's Sparrow	G3		Mostly Outside
FISH					
AFCAA01020	*Acipenser fulvescens*	Lake Sturgeon	G3		Peripheral
AFCAA02010	*Scaphirhynchus albus*	Pallid Sturgeon	G1G2	LE	Peripheral
AFCJB28080	*Notropis anogenus*	Pugnose Shiner	G3		Peripheral
AFCJB28960	*Notropis topeka*	Topeka Shiner	G2	C	Mostly Outside
AFCJC04010	*Cycleptus elongatus*	Blue Sucker	G3		Peripheral
AFCJC10170	*Moxostoma valenciennesi*	Greater Redhorse	G3		Peripheral
INSECTS					
IILEP37171	*Erynnis persius persius*	Persius Dusky Wing	G4T2T3		Peripheral
IILEP57010	*Oarisma powesheik*	Powesheik Skipperling	G2G3		Mostly Within
IILEP65050	*Hesperia ottoe*	Ottoe Skipper	G3?		Mostly Outside
IILEP65140	*Hesperia dacotae*	Dakota Skipper	G2G3		Mostly Within
IILEPJ6040	*Speyeria idalia*	Regal Fritillary	G3		Mostly Outside
MOLLUSKS					
IMBIV06010	*Arcidens confragosus*	Rock-Pocketbook	G3		Peripheral
IMBIV24020	*Leptodea leptodon*	Scaleshell	G2G3		Peripheral
IMBIV34030	*Plethobasus cyphyus*	Sheepnose	G3		Peripheral
IMBIV41010	*Simpsonaias ambigua*	Salamander Mussel	G2		Peripheral

DICOT PLANTS

PDAST2E1C0	*Cirsium hillii*	Hill's Thistle	G3		Peripheral
PDFAB27090	*Lespedeza leptostachya*	Prairie Bush-Clover	G2	LT	Mostly Within
PDSCR01130	*Agalinis auriculata*	Earleaf Foxglove	G2		Peripheral
PDSCR09030	*Besseya bullii*	Kitten Tails	G3		Peripheral
PDVAL03073	*Valeriana edulis ciliata*	Hairy Valerian	G5T3?		Peripheral

MONOCOT PLANTS

PMORC1Y0S0	*Platanthera praeclara*	Western Prairie Fringed Orchid	G2	LT	Mostly Within

PTERIDOPHYTE PLANTS

PPOPH010W0	*Botrychium campestre*	Prairie Moonwort	G3	Mostly Outside
PPOPH01150	*Botrychium gallicomontanum*	Frenchman's Bluff Moonwort	G1	Endemic

Appendix 3:

Secondary Target Species in the Northern Tallgrass Prairie

Appendix 3: Secondary Target Species in the Northern Tallgrass Prairie

Element Code	Scientific Name	Common Name	Global Rank	USESA	Level of Endemism
AMPHIBIANS					
AAABB01080	*Bufo hemiophrys*	Canadian Toad	G4		Mostly Within ?
BIRDS					
ABNLC13013	*Tympanuchus cupido pinnatus*	Greater Prairie Chicken	G4T4		Peripheral
ABNLC13030	*Tympanuchus phasianellus*	Sharp-Tailed Grouse	G4		Peripheral
ABPBXA6040	*Calcarius ornatus*	Chestnut-Collared Longspur	G5		Peripheral
MAMMALS					
AMAFC02010	*Geomys bursarius*	Plains Pocket Gopher	G5		Mostly Outside
AMAFD01020	*Perognathus flavescens*	Plains Pocket Mouse	G5		Mostly Outside
AMAFF11140	*Microtus ochrogaster*	Prairie Vole	G5		Mostly Outside
AMAJA01030	*Canis lupus*	Gray Wolf	G4		Peripheral
AMAJB01010	*Ursus americanus*	Black Bear	G5		Peripheral
AMAJF04010	*Taxidea taxus*	American Badger	G5		Mostly Outside
AMAJF05010	*Spilogale putorius*	Eastern Spotted Skunk	G5		Mostly Outside
AMAJH01020	*Felis concolor*	Mountain Lion	G5		Peripheral
AMAJH03020	*Lynx rufus*	Bobcat	G5		Peripheral
AMALC01010	*Cervus elaphus*	Wapiti or Elk	G5		Peripheral
AMALC03010	*Alces alces*	Moose	G5		Peripheral
REPTILES					
ARACH01102	*Eumeces septentrionalis septentrionalis*	Northern Prairie Skink	G5T5		Mostly Outside

INSECTS

IIHEM28010	*Chlorochroa belfragii*	Belfragi's Chlorochroan Bug	G?	Endemic?
IIHOM08010	*Aflexia rubranura*	Redveined Prairie Leafhopper	G?	Peripheral?
IILEP70012	*Atrytone arogos iowa*	Iowa Skipper	G3G4T3	Mostly Outside

Appendix 4:

**Target Communities in the
Northern Tallgrass Prairie**

Appendix 4: Target Communities in the Northern Tallgrass Prairie

Global Rank	Scientific Name	Common Name	Element Code
Endemic Distribution, Matrix Pattern			
G2G3	Andropogon gerardii – Stipa spartea – Sporobolus heterolepis Herbaceous Vegetation	Northern Mesic Tallgrass Prairie	CEGL002202
G3?	Schizachyrium scoparium – Bouteloua curtipendula – Stipa spartea – (Pascopyrum smithii) Hill Herbaceous Vegetation	Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie	CEGL002377
G3?	Spartina pectinata – Calamagrostis stricta – Carex spp. Herbaceous Vegetation	Northern Cordgrass Wet Prairie	CEGL002027
Endemic Distribution, Large-Patch Pattern			
G1Q	Quercus macrocarpa Northern Tallgrass Wooded Herbaceous Vegetation	Northern Bur Oak Openings	CEGL002158
G2G3	Schizachyrium scoparium – Bouteloua spp. – Stipa spartea Gravel Herbaceous Vegetation	Northern Little Bluestem Gravel Prairie	CEGL002499
G2G3	Tilia americana – (Quercus macrocarpa) / Ostrya virginiana Forest	Bur Oak – Basswood Forest	CEGL002012
G3?	Populus tremuloides – Quercus macrocarpa – Salix spp. / Andropogon gerardii Shrubland	Aspen – Oak Brush Prairie	CEGL002182
G3G4	Andropogon gerardii – (Panicum virgatum) – Muhlenbergia richardsonis Herbaceous Vegetation	Northern Wet-Mesic Tallgrass Prairie	CEGL002199
G4	Quercus macrocarpa / Amelanchier alnifolia / Aralia nudicaulis – Carex assiniboinensis Forest	Northern Bur Oak Mesic Forest	CEGL002072
G4G5	Populus tremuloides / Corylus spp. / Andropogon gerardii Woodland	Aspen Parkland Tallgrass Woodland	CEGL005205
G?	Quercus macrocarpa – Populus tremuloides / Corylus spp. Woodland	Bur Oak – Aspen Woodland	CEGL002139
Endemic Distribution, Small-Patch Pattern			
G2	Carex prairea – Scirpus americanus – Rhynchospora capillacea Herbaceous Vegetation	Great Plains Calcareous Fen	CEGL002267
G3?	Quartzite – Granite Rock Outcrop Sparse Vegetation	Quartzite – Granite Rock Outcrop	CEGL002298
Limited Distribution, Matrix Pattern			
G4?	Acer saccharum – Tilia americana / Ostrya virginiana – Carpinus caroliniana Forest	North-Central Maple – Basswood Forest	CEGL002062

Limited Distribution, Large-Patch Pattern

G2	Quercus macrocarpa – (Quercus ellipsoidalis) / Schizachyrium scoparium – Koeleria macrantha Wooded Herbaceous Vegetation	Northern Oak Barrens	CEGL002160
G2	Schizachyrium scoparium – Sorghastrum nutans – Bouteloua curtipendula Dry Gravel Herbaceous Vegetation	Midwest Dry Gravel Prairie	CEGL002215
G2G3	Schizachyrium scoparium – Stipa spartea – Bouteloua (curtipendula, gracilis) Sand Herbaceous Vegetation	Little Bluestem – Porcupine Grass – Grama Grass Sand Prairie	CEGL005204
G3?	Salix petiolaris – (Betula pumila) / Spartina pectinata – Carex lanuginosa Shrubland	Willow Wet Brush Prairie	CEGL002434
G3G4	Cornus sericea – Salix (bebbiana, discolor, petiolaris) / Calamagrostis stricta Shrubland	Dogwood – Mixed Willow Shrub Meadow	CEGL002187
G5	Populus tremuloides / Corylus americana Forest	Aspen / American Hazel Forest	CEGL002063

Limited Distribution, Small-Patch Pattern

G2?	Calamagrostis stricta – Carex sartwellii – Carex praegracilis – Plantago eriopoda Saline Herbaceous Vegetation	Saline Wet Meadow	CEGL002255
G3	Betula pumila – Salix spp. Prairie Transition Fen Shrubland	Bog Birch – Willow Prairie Transition Fen	CEGL002189
G3?	Carex lasiocarpa – Calamagrostis spp. – (Eleocharis rostellata) Herbaceous Vegetation	Prairie Transition Rich Fen	CEGL002383
G4?	Fraxinus pennsylvanica – Celtis occidentalis – Tilia americana – (Quercus macrocarpa) Forest	Ash – Elm – Mixed Lowland Hardwood Forest	CEGL002081
G?	Distichlis spicata – Hordeum jubatum – Puccinellia nuttalliana – Suaeda calceoliformis Herbaceous Vegetation	Northern Great Plains Saline Prairie	CEGL002273

Widespread Distribution, Large-Patch Pattern

G3G4	Phragmites australis Herbaceous Vegetation	Reed Marsh	CEGL001475
G3G4	Populus deltoides – Salix nigra Forest	Cottonwood – Black Willow Forest	CEGL002018
G5	Cornus spp. – Salix discolor – (Rosa palustris) Shrubland	Dogwood – Pussy Willow Swamp	CEGL002186
G5	Scirpus acutus – Typha spp. – Mixed Herbs Midwest Herbaceous Vegetation	Midwest Mixed Emergent Deep Marsh	CEGL002229
G5	Typha spp. Midwest Herbaceous Vegetation	Midwest Cattail Deep Marsh	CEGL002233
G?	Fraxinus pennsylvanica – (Ulmus americana) – Acer negundo Forest	Great Plains Ash – Elm – Boxelder Forest	CEGL002088
G?	Scirpus fluviatilis – Scirpus spp. Herbaceous Vegetation	River Bulrush Marsh	CEGL002221
G?	Scirpus tabernaemontani – Typha spp. – (Sparganium spp. – Juncus spp.) Herbaceous Vegetation [Provisional]	Bulrush – Cattail – Burreed Shallow Marsh	CEGL002026

Widespread Distribution, Small-Patch Pattern

G4?	Carex aquatilis – Carex spp. Herbaceous Vegetation	Water Sedge Wet Meadow	CEGL002262
G4?	Carex stricta – Carex spp. Herbaceous Vegetation	Tussock Sedge Wet Meadow	CEGL002258
G5Q	Potamogeton spp. – Ceratophyllum spp. Midwest Herbaceous Vegetation	Midwest Pondweed Submerged Aquatic Wetland	CEGL002282
G?	Carex atherodes Herbaceous Vegetation	Awned Sedge Wet Meadow	CEGL002220
G?	River Mud Flats Sparse Vegetation	River Mud Flats	CEGL002314
G?	Scirpus acutus – (Scirpus fluviatilis) Freshwater Herbaceous Vegetation	Freshwater Bulrush Marsh	CEGL002225

Peripheral Distribution, Matrix Pattern

G2	Andropogon gerardii – Sorghastrum nutans – (Sporobolus heterolepis) – Liatris spp. – Ratibida pinnata Herbaceous Vegetation	Central Mesic Tallgrass Prairie	CEGL002203
G2	Andropogon gerardii – Sorghastrum nutans – Stipa spartea Loess Hills Herbaceous Vegetation	Loess Tallgrass Prairie	CEGL002025
G3Q	Quercus alba – Quercus rubra – Quercus macrocarpa / Carpinus caroliniana Forest	Northern Mixed Oak / Musclewood Forest	CEGL002459
G3Q	Quercus alba – Quercus rubra – Quercus macrocarpa / Corylus americana Forest	Northern Mixed Oak / Hazel Forest	CEGL002460
G3G4	Stipa comata – Bouteloua gracilis – Carex filifolia Herbaceous Vegetation	Needle-and-Thread – Blue Grama Mixedgrass Prairie	CEGL002037
G4	Pascopyrum smithii – Stipa comata Central Mixedgrass Herbaceous Vegetation	Wheatgrass – Needle-and-Thread Mixedgrass Prairie	CEGL002034
G4?	Quercus alba – Quercus rubra – Carya ovata Forest	White Oak – Red Oak Dry-Mesic Forest	CEGL002068
G5	Picea glauca – Abies balsamea – Populus tremuloides / Mixed Herbs Forest	Spruce – Fir – Aspen Forest	CEGL002475

Peripheral Distribution, Large-Patch Pattern

G2	Schizachyrium scoparium – Bouteloua curtipendula – Bouteloua hirsuta – (Yucca glauca) Herbaceous Vegetation	Loess Hills Little Bluestem Dry Prairie	CEGL002035
G2?	Betula papyrifera / Corylus cornuta Forest	Paper Birch / Hazel Forest	CEGL002079
G2Q	Andropogon gerardii – Sporobolus heterolepis – Schizachyrium scoparium – Pascopyrum smithii Herbaceous Vegetation	Northern Plains Transition Bluestem Prairie	CEGL002376
G2Q	Populus deltoides – Fraxinus pennsylvanica Forest [Provisional]	Cottonwood – Green Ash Floodplain Forest	CEGL000658
G2G3	Quercus alba – Carya ovata / Ostrya virginiana Forest	White Oak – Hickory Forest	CEGL002011
G2G3	Schizachyrium scoparium – Sorghastrum nutans – Bouteloua curtipendula Dry – Mesic Herbaceous Vegetation	Midwest Dry-Mesic Prairie	CEGL002214
G3	Calamovilfa longifolia – Andropogon hallii Herbaceous Vegetation	Prairie Sandreed – Sand Bluestem Prairie	CEGL001469
G3	Quercus macrocarpa / Corylus americana – Amelanchier alnifolia Woodland	Bur Oak / Hazelnut Woodland	CEGL000556
G3	Quercus velutina – (Quercus alba) – Quercus ellipsoidalis / Schizachyrium scoparium – Lupinus perennis Wooded Herbaceous Vegetation	Black Oak / Lupine Barrens	CEGL002492
G3?	Spartina pectinata – Carex spp. – Calamagrostis canadensis – Lythrum alatum – (Oxypolis rigidior) Herbaceous Vegetation	Central Cordgrass Wet Prairie	CEGL002224
G3G4	Acer saccharum – Acer nigrum – Tilia americana – Quercus rubra / Ostrya virginiana Forest	Central Maple – Basswood Forest	CEGL002061
G3G4	Carex oligosperma – Carex lasiocarpa / Sphagnum spp. – Polytrichum spp. Herbaceous Vegetation	Northern Poor Fen	CEGL002265
G3G4	Quercus alba – Quercus macrocarpa – Quercus rubra / Corylus americana Woodland	Northern Dry-Mesic Oak Woodland	CEGL002142
G4	Acer rubrum – Fraxinus spp. – Betula papyrifera / Cornus canadensis Forest	Red Maple – Ash – Birch Swamp Forest	CEGL002071
G4	Artemisia cana / Pascopyrum smithii Shrubland	Silver Sagebrush/Western Wheatgrass Shrub Prairie	CEGL001072
G4	Fraxinus nigra – Mixed Hardwoods-Conifers / Cornus sericea / Carex spp. Forest	Black Ash – Mixed Hardwood Swamp	CEGL002105
G4	Larix laricina / Alnus incana Forest	Tamarack Minerotrophic Swamp	CEGL002471

G4	Pascopyrum smithii – Nassella viridula Herbaceous Vegetation	Western Wheatgrass – Green Needlegrass Mixedgrass Prairie	CEGL001583
G4	Thuja occidentalis – (Picea mariana – Abies balsamea) / Alnus incana Forest	White Cedar – (Mixed Conifer) / Alder Swamp	CEGL002456
G4	Thuja occidentalis / Abies balsamea – Acer spicatum Forest	White Cedar – Boreal Conifer Mesic Forest	CEGL002449
G4?	Acer saccharinum – Ulmus americana – (Populus deltoides) Forest	Silver Maple – Elm – (Cottonwood) Forest	CEGL002586
G4?	Betula papyrifera / Acer saccharum – Mixed Hardwoods Forest	Paper Birch / Sugar Maple – Mixed Hardwoods Forest	CEGL002464
G4?	Larix laricina / Aronia melanocarpa / Sphagnum spp. Forest	Central Tamarack Poor Fen	CEGL002472
G4?	Quercus ellipsoidalis Forest	Northern Pin Oak Forest	CEGL002077
G5	Larix laricina / Sphagnum spp. Forest	Northern Tamarack Poor Fen	CEGL002515
G5	Picea mariana / Alnus incana / Sphagnum spp. Forest	Black Spruce / Alder Rich Swamp	CEGL002452
G5	Picea mariana / Chamaedaphne calyculata / Sphagnum spp. Woodland	Black Spruce Bog	CEGL002485
G5?	Alnus incana Swamp Shrubland [Provisional]	Speckled Alder Swamp	CEGL002381
G5Q	Calamagrostis canadensis Eastern Herbaceous Vegetation [Provisional]	Bluejoint Eastern Marsh	CEGL005174
G?	Fraxinus pennsylvanica – Ulmus spp. – Celtis occidentalis Forest	Central Green Ash – Elm – Hackberry Forest	CEGL002014
G?	Populus tremuloides – Populus balsamifera / Calamagrostis canadensis Forest	Mixed Aspen Swamp	CEGL002097
G?Q	Fraxinus pennsylvanica – Ulmus americana – (Celtis occidentalis, Tilia americana) Northern Forest	Northern Ash – Elm – Hackberry Floodplain Forest	CEGL002089

Peripheral Distribution, Small-Patch Pattern

G2?	Potamogeton pectinatus – Ruppia maritima Herbaceous Vegetation	Sago Pondweeed Submerged Wetland	CEGL002004
G2G3	Schizachyrium scoparium – Danthonia spicata – Carex pensylvanica – (Viola pedata) Herbaceous Vegetation	Midwest Dry Sand Prairie	CEGL002318
G3	Andropogon hallii – Carex inops ssp. heliophila Herbaceous Vegetation	Sand Bluestem – Sedge Sand Prairie	CEGL001466
G3	Calamovilfa longifolia – Carex filifolia Herbaceous Vegetation	Prairie Sandreed Sand Prairie	CEGL001470
G3	Typha spp. – Equisetum hyemale – Carex spp. Seep Herbaceous Vegetation	Great Plains Neutral Seep	CEGL002033
G3G4	Pentaphylloides floribunda / Carex sterilis – Andropogon gerardii – Cacalia plantaginea Shrub Herbaceous Vegetation	Cinquefoil – Sedge Prairie Fen	CEGL005139
G4	Hordeum jubatum Herbaceous Vegetation	Foxtail Barley Meadow	CEGL001798
G4G5	Betula pumila / Chamaedaphne calyculata / Carex lasiocarpa Shrubland	Bog Birch Poor Fen	CEGL002494
G4G5	Carex lacustris Herbaceous Vegetation	Lake Sedge Wet Meadow	CEGL002256
G4G5	Carex lasiocarpa – Carex buxbaumii – Scirpus cespitosus Boreal Herbaceous Vegetation	Boreal Rich Fen	CEGL002500
G4G5	Symphoricarpos occidentalis Shrubland [Provisional]	Wolfberry Shrubland	CEGL001131
G4G5Q	Carex (rostrata, utriculata) – Carex lacustris – (Carex vesicaria) Herbaceous Vegetation	Northern Sedge Wet Meadow	CEGL002257
G5Q	Salix exigua Shrubland [Provisional]	Sandbar Willow Shrubland	CEGL001197
G?	Amelanchier alnifolia Shrubland	Saskatoon Serviceberry Shrubland	CEGL002183
G?	Carex lanuginosa – Calamagrostis stricta Herbaceous Vegetation	Bluejoint – Wooly Sedge Wet Meadow	CEGL002254
G?	Saline Spring Mud Flats Sparse Vegetation	Saline Spring Mud Flats	CEGL002581
G?	Scirpus maritimus – Scirpus acutus – (Triglochin maritimum) Herbaceous Vegetation	Bulrush Brackish Marsh	CEGL002227
G?	Scolochloa festucacea Herbaceous Vegetation	Sprangletop Marsh	CEGL002260
G?	Shale Barren Slopes Sparse Vegetation	Shale Barren Slopes	CEGL002294

Appendix 5:

A Method for Characterizing Natural Communities

Appendix 5: A Method for Characterizing Natural Communities

As part of the coarse-filter approach, all community types in an ecoregion are conservation targets. Yet, given a defined ecoregion, some communities are more typical of the ecoregion than others; similarly, the distribution of a target occurrence across the landscape also is highly variable. A means of characterizing community types emphasizing community pattern and community distribution may be helpful in setting ecoregional conservation goals and establishing the sequence of target selection in the design stage.

COMMUNITY PATTERN

One way to characterize natural communities is to relate distribution patterns of natural communities to landscape features and ecological processes in the ecoregion. The distribution pattern of a specific community target across the landscape can help dictate its position within portfolio design selection sequence. A simplifying approach that helps clarify this relationship is to group natural communities into three categories based on their potential (or existing) landscape pattern (as developed by Mark Anderson [1997] of the Conservancy's Eastern Conservation Science Department):

Matrix Communities: Those communities that form extensive and often contiguous cover (perhaps together covering 75-80 percent of the ecoregion). These communities occur on the most widespread landform types. Individual occurrences range from 1,000-1,000,000 acres. Examples in the Northern Tallgrass Prairie Ecoregion include Northern Mesic Tallgrass Prairie on glacial lake plains, low ground moraine and river valleys and Little Bluestem-Porcupine Grass Hill Prairie on terminal and ground moraines, bluffs and river terraces.

Large Patch Communities: Those communities that form large, but interrupted cover (perhaps together covering 20 percent of the ecoregion). These communities occur on less prominent landform types, but ones that are related to dominant landform features. Individual occurrences range from 50-1,000 acres. Examples in the Northern Tallgrass Prairie Ecoregion include Great Plains Little Bluestem Gravel Prairie found on river terraces and beach ridges associated with the edges of lakeplains, or Lake Sedge Wet Meadow and Great Plains Bulrush-Cattail Marsh found in large wet basins.

Small Patch Communities: Those communities that form small, discrete cover (perhaps in total covering up to 5 percent of the ecoregion). These communities occur on specialized landform types or unusual microhabitats. Individual occurrences range from 1-50 acres. Examples in the Northern Tallgrass Prairie Ecoregion include Great Plains Calcareous Fen found in seeps along beach ridges, moraines and river valleys, or Saline Wet Meadow found in local saline upwellings in lakeplains.

Matrix community types often are influenced by large-scale processes, such as fire, and are important to wide-ranging fauna, such as big herbivores (bison), or large birds (prairie chickens). Large-patch community types also are influenced by large-scale processes, but these tend to be modified by specific site features that influence the community. Small-patch community types have very restricted ecological processes that can be quite different from the large-scale processes. Their specialized conditions are, however, often dependent on the maintenance of natural conditions around them.

COMMUNITY DISTRIBUTION

A second way to characterize community targets within an ecoregion is by their distribution within and outside of the ecoregion. The degree to which the rangewide distribution of a community target is encompassed by a given ecoregion can be used effectively as a means of establishing ecoregional conservation goals. Again, a simplified way to characterize their distribution is to place them in four categories (as developed by Mark Anderson [1997] of the Conservancy's Eastern Conservation Science Department).

Endemic (Restricted): A community that is found primarily or only in the ecoregion. Examples for the Northern Tallgrass Prairie Ecoregion include Northern Mesic Tallgrass Prairie or Aspen-Oak Brush Prairie.

Limited: A community that typically is found in several ecoregions in addition to the one in question. Note that LIMITED has been redefined here from previous memos on the northern tallgrass prairie to fit Anderson's definition of these categories.

Widespread: A community that typically is found in the ecoregion and is common in many other ecoregions. Examples for the Northern Tallgrass Prairie Ecoregion include Midwest Cattail Deep Marsh and the Tussock Sedge Wet Meadow.

Peripheral: A community that rarely occurs in the ecoregion and is found more commonly in other ecoregions. Examples for the Northern Tallgrass Prairie Ecoregion include Paper Birch/Northern Hardwoods Forest and Black Spruce/Alder Swamp.

Appendix 6:

Northern Tallgrass Prairie Conservation Goal Status Report: Target Species

Appendix 6: Northern Tallgrass Prairie Conservation Goal Status Report: Target Species

Element Code	GRank	Element Name	
		Sitename, Subsection, State/Province	Rank

BIRDS

ABNFC01010   G3   American White Pelican

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Woodlands –Lake Francis, 222Na, MB	C
Upper Minnesota River Valley, 251Ba, MN	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Rangewide Conservation Goal: 10
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: The status and population trends of the two ecoregion occurrences need to be assessed.

ABNNB03070   G3   Piping Plover

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Shoal Lakes, 222Na, MB	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: More information is required to determine population trends of ecoregion occurrences, in particular the Shoal Lakes population.

ABNNM08102   G4T2Q   Interior Least Tern

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: The rank and significance of ecoregion occurrences relative to the rangewide distribution of the species needs to be assessed.

ABPBXA0010   G3   Baird's Sparrow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
>   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
>   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
>   None

> Rangewide Conservation Goal: 10
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: None.

FISH

AFCAA01020   G3   Lake Sturgeon

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
>   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
>   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
>   None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: More information is required to document the status of the species in the ecoregion, particularly within the Red and Assiniboine Rivers.

AFCAA02010   G1G2   Pallid Sturgeon

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
>   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
>   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
>   None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: The rank and significance of ecoregion occurrences (in the Missouri River) relative to the rangewide distribution of the species needs to be assessed.

AFCJB28080   G3   Pugnose Shiner

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
        None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
        None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
        None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: More documentation on the status of the species in the Ottertail River (apparently its only occurrence in the ecoregion) is needed.

AFCJB28960   G2   Topeka Shiner

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
        None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
        None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
        None

> Rangewide Conservation Goal: 10
> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Extant occurrences in the ecoregion need to be further assessed to determine current population size and rank, and critical stream reaches. Additional inventory is needed within streams and rivers in southwest Minnesota and southeastern South Dakota.

AFCJC04010   G3   Blue Sucker

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)
        None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)
        None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals
        None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: The rank and significance of ecoregion occurrences (in the Missouri River) relative to the rangewide distribution of the species needs to be assessed.

AFCJC10170   G3   Greater Redhorse

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: 2
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
Data Gaps: Determine the status of two apparently healthy populations in the Ottertail and Redwood Rivers of Minnesota.

INSECTS

IILEP37171   G4T2T3   Persius Dusky Wing

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: TBD
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: TBD
Data Gaps: Verify identification of two reported specimens from the ecoregion.

IILEP57010   G2G3   Powesheik Skipperling

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

Felton Prairie, 251Aa, MN	A
Prairie Coteau SNA, 251Bb, MN	A
Scarlet Fawn Prairie, 251Bb, SD	A
Crystal Springs, 251Bb, SD	A
Hole-in-the-Mountain, 251Bb, MN	A
Bluestem Prairie, 251Aa, MN	AB
Upper Minnesota River Valley, 251Ba, MN	AB
Sheyenne Delta, 251Ab, ND	B
Little Sioux River, Upper, 251Bb, IA	B
Wambach WMA, Wambach – Santee Prairie, 251Aa, MN	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Hankinson, 251Aa, ND	C
Aurora Prairie, 251Bc, SD	C
Hoffman Prairie State Preserve, 251Be, IA	C

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Prairie WMA -WPA and Schellberg Prairie, 251Ba, MN	B
Chanarambie Creek Valley, 251Bb, MN	B
Walls 7 and Windsor 26, 251Aa, MN	BC

> Rangewide Conservation Goal: 15
> Ecoregional Conservation Goal: 12
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Conduct additional inventories within the ecoregion to document status of occurrence quality, particularly within Manitoba, northern Minnesota and eastern South Dakota.

IILEP65050   G3?   Ottoe Skipper

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

Hole-in-the-Mountain, 251Bb, MN	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Bonanza Prairie SNA, 251Ba, MN	C
Shaokatan 31, 251Bb, MN	C

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Rangewide Conservation Goal: 10
> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 3
> Data Gaps: Enhance inventory and documentation of occurrences within eastern South Dakota (particularly the Prairie Coteau).

IILEP65140   G2G3   Dakota Skipper

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Felton Prairie, 251Aa, MN	A
Hole-in-the-Mountain, 251Bb, MN	A
Prairie Coteau SNA, 251Bb, MN	A
Scarlet Fawn Prairie, 251Bb, SD	A
Crystal Springs, 251Bb, SD	A
Sheyenne Delta, 251Ab, ND	B
Upper Minnesota River Valley, 251Ba, MN	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Chanarambie Creek Valley, 251Bb, MN	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Rangewide Conservation Goal: 10
Ecoregional Conservation Goal: 10
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 3
Data Gaps: Distribution and occurrence quality within the ecoregion is generally well documented, with the exception of Manitoba and northern Minnesota.

IILEPJ6040   G3   Regal Fritillary

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Bluestem Prairie, 251Aa, MN	A
Upper Minnesota River Valley, 251Ba, MN	A
Hole-in-the-Mountain, 251Bb, MN	A
Crystal Springs, 251Bb, SD	A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Rangewide Conservation Goal: 10
Ecoregional Conservation Goal: 4
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
Data Gaps: Document the quality of the numerous occurrences in the ecoregion, particularly those on existing managed areas.

MOLLUSKS

IMBIV06010   G3   Rock-Pocketbook

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: 1
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
Data Gaps: Presumed extirpated from the ecoregion. Confirm loss of the species from the Minnesota River.

IMBIV24020   G2G3   Scaleshell

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: 1
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
Data Gaps: Document the status of occurrences within the Missouri River.

IMBIV34030   G3   Sheepnose

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: 1
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
Data Gaps: Document the status of occurrences within the Missouri River.

IM B IV 41010   G 2   Salamander Mussel

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Rangewide Conservation Goal: TBD
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Presumed extirpated from the ecoregion. Confirm loss of the species from the Minnesota River.

DICOT PLANTS

PDAST2E1C0   G 3   Hill's Thistle

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Rangewide Conservation Goal: 10
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: None.

PDFAB27090   G 2   Prairie Bush-Clover

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Cottonwood River Prairies, 251Ba, MN	A
Great Bend Prairies, 251Ba, MN	A
Red Rock Prairie, 251Ba, MN	A
Des Moines River Valley, 251Bb, MN	A
Little Sioux River, Upper, 251Bb, IA	A
Anderson Prairie - Crimm Savanna, 251Bb, IA	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Stinson Prairie State Preserve, 251Be, IA	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Rangewide Conservation Goal: 10
> Ecoregional Conservation Goal: 6
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Conduct additional inventories for the species in Iowa and southern Minnesota.

PDSCR01130   G2   Earleaf Foxglove

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

     None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

     None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

     None

Rangewide Conservation Goal: 10
Ecoregional Conservation Goal: 1
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
Data Gaps: Determine the quality of the single ecoregional occurrence at Chippewa Prairie.

PDSCR09030   G3   Kitten Tails

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

     None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

     None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

     None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: 1
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
Data Gaps: None.

PDVAL03073   G5T3?   Hairy Valerian

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

     None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

     None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

     None

Rangewide Conservation Goal: TBD
Ecoregional Conservation Goal: TBD
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: TBD
Data Gaps: The taxonomy of the subspecies is questionable and needs to be confirmed. If confirmed, additional inventories in Iowa and states adjoining Minnesota are needed to confirm the taxa's global rank.

MONOCOT PLANTS

PMORC1Y0S0 G2   Western Prairie Fringed Orchid

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Tolstoi-Gardenton, 222Na, MB	A
Pembina Prairie, 251Aa, MN	A
Sheyenne Delta, 251Ab, ND	A
Blue Mounds, 251Bc, MN	A
Goose Lake Parkland, 222Na, MN	B
Bluestem Prairie, 251Aa, MN	B
Burnham, 251Aa, MN	B
Steele Prairie State Preserve, 251Bd, IA	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Lake Bronson Parkland, 222Na, MN	C
Godfrey WMA, 251Aa, MN	C
Dalby WMA, 251Aa, MN	C
Mentor Prairie, 251Aa, MN	C
Dugdale WMA, 251Aa, MN	C
Pipestone National Monument, 251Bc, MN	C
Kalsow Prairie State Preserve, 251Be, IA	C
Felton Prairie, 251Aa, MN	CD

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Rangewide Conservation Goal: 15
Ecoregional Conservation Goal: 10
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
Data Gaps: Continue inventory throughout the ecoregion.

PTERIDOPHYTE PLANTS

PPOPH010W0 G3   Prairie Moonwort

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Lake Bronson Parkland, 222Na, MN	A
Upper Minnesota River Valley, 251Ba, MN	A
Hole-in-the-Mountain, 251Bb, MN	A
Barnesville, 251Aa, MN	B
Antelope Hills North and South, 251Ba, MN	B
Bonanza Prairie SNA, 251Ba, MN	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Rangewide Conservation Goal: 10
Ecoregional Conservation Goal: 6
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
Data Gaps: Continue inventory throughout the ecoregion, in particular the Prairie Coteau, Sheyenne Delta and Manitoba.

PPO PH 01150   G1   Frenchman's Bluff Moonwort

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      Frenchmans Bluff, 251Aa, MN   A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Rangewide Conservation Goal: 1
> Ecoregional Conservation Goal: 1
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Continue inventory throughout the ecoregion.

Appendix 7:

Northern Tallgrass Prairie Conservation Goal Status Report: Target Communities

Appendix 7: Northern Tallgrass Prairie
Conservation Goal Status Report: Target Communities

Element Code   GRank   Element Name

Sitename, Subsection, State/Province   Rank

Endemic Distribution, Matrix Pattern

CEGL002202   G2G3   Northern Mesic Tallgrass Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Pankratz Prairie, 251Aa, MN	AB
Felton Prairie, 251Aa, MN	AB
Tolstoi-Gardenton, 222Na, MB	B
Bluestem Prairie, 251Aa, MN	B
Sheyenne Delta, 251Ab, ND	B
Prairie WMA-WPA and Schellberg Prairie, 251Ba, MN	B
Upper Minnesota River Valley, 251Ba, MN	B
Spring Grove – Summit, 251Bb, SD	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Steele Prairie State Preserve, 251Bd, IA	BC
Sioux Prairie, 251Bc, SD	C
Kalsow Prairie State Preserve, 251Be, IA	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Hankinson, 251Aa, ND	B
Pembina Prairie, 251Aa, MN	B
Waubay NWR, 251Bb, SD	B
Sica Hollow, 251Bb, SD	B

Ecoregional Conservation Goal: 10
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
Data Gaps: Two selections pending in the Prairie Coteau. Inventory complete in northern portion of the Coteau (Leoschke 1997). Site selection needs to be conducted.

CEGL002377   G3?   Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Hole-in-the-Mountain, 251Bb, MN	AB
Prairie Coteau SNA, 251Bb, MN	AB
Spring Grove – Summit, 251Bb, SD	B
Des Moines River Valley, 251Bb, MN	B
Little Sioux River, Upper, 251Bb, IA	B
Crystal Springs, 251Bb, SD	B
Little Sioux River, Lower, 251Be, IA	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Walls 7 and Windsor 26, 251Aa, MN	C
Chanarambie Creek Valley, 251Bb, MN	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 3
> Data Gaps: Much of Iowa's northwest dry-mesic hill prairie is placed in Midwest Dry-Mesic Prairie
> (CEGL002214), probably inappropriately. Distribution and conservation targets for that community need further
> review. If taxonomy is changed several other Iowa sites may be selected.

CEGL002027   G3?   Northern Cordgrass Wet Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Rothsay Prairie, 251Aa, MN	A
Goose Lake Parkland, 222Na, MN	B
Hankinson, 251Aa, ND	B
Twin Valley – Cupido Prairie, 251Aa, MN	B
Pembina Prairie, 251Aa, MN	B
Sheyenne Delta, 251Ab, ND	B
Upper Minnesota River Valley, 251Ba, MN	B
Kalsow Prairie State Preserve, 251Be, IA	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Steele Prairie State Preserve, 251Bd, IA	BC
Woodlands – Lake Francis, 222Na, MB	C
Kirchner Prairie, 251Bb, IA	C
Aurora Prairie, 251Bc, SD	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Bluestem Prairie, 251Aa, MN	AB
Felton Prairie, 251Aa, MN	B
Pankratz Prairie, 251Aa, MN	B
Chicog Prairie, 251Aa, MN	B

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: North Dakota's wet-mesic prairies (Northern Wet-Mesic Tallgrass Prairie [CEGL002199]) are treated
> with this type for the purposes of conservation planning; see comments for that type. This type also grades into
> Bluejoint-Wooly Sedge Meadow (CEGL002254).

Endemic Distribution, Large-Patch Pattern

CEGL002139   G?   Bur Oak – Aspen Woodland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 10
> Data Gaps: Extensive stands occur in the Tolstoi-Gardenton Macrosite, as well as Kittson Co., Minnesota. See also Northern Bur Oak Mesic Forest (CEGL002072). Many of the forested sites should perhaps be managed for this type. Further Heritage/CDC Program survey is needed for additional sites.

CEGL002158   G1Q   Northern Bur Oak Openings

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Pembina Hills, 251Aa, ND	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Waubay NWR, 251Bb, SD	C
Little Sioux River, Lower, 251Be, IA	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 9
> Data Gaps: Type is very rare, and most sites are in woodland or forest condition. Further Heritage/CDC Program review of the taxonomy of this type may help clarify where good examples are found.

CEGL002012   G2G3   Bur Oak – Basswood Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Spring Grove – Summit, 251Bb, SD	AB
Sheyenne Delta, 251Ab, ND	B
Sica Hollow, 251Bb, SD	B
Hole-in-the-Mountain, 251Bb, MN	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 6
> Data Gaps: Possible sites in the Prairie Coteau and Minnesota River Valley. Many potential sites are overgrazed or logged. This type is geographically distinguished from the North-Central Maple Basswood Forest (CEGL002062), whose range extends into the eastern part of this ecoregion, and type contains sugar maple and a richer herbaceous layer.

CEGL002499   G2G3   Northern Little Bluestem Gravel Prairie

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

Felton Prairie, 251Aa, MN	AB
Chester Hills, 222Ma, MN	B
Bluestem Prairie, 251Aa, MN	B
Chicog Prairie, 251Aa, MN	B
Frenchmans Bluff, 251Aa, MN	B
Mehurin 12 and 13, 251Ba, MN	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Lake Bronson Parkland, 222Na, MN	C
Pankratz Prairie, 251Aa, MN	C
Little Sioux River, Upper, 251Bb, IA	C
Little Sioux River, Lower, 251Be, IA	C
Antelope Hills North and South, 251Ba, MN	CD

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Upper Minnesota River Valley, 251Ba, MN	B

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is north of IA in the ecoregion. For Iowa gravel prairies, see Midwest Dry Gravel Prairie (CEGL002215), whose northwestern stands may fit better with this type.

CEGL002182   G3?   Aspen–Oak Brush Prairie

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

Two Rivers Parkland, 222Na, MN	AB
Caribou Parkland, 222Na, MN	AB
Devil's Playground, 222Na, MN	B
Lake Bronson Parkland, 222Na, MN	B
Bejou WMA, 251Aa, MN	B
Faith Prairie, 251Aa, MN	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Pelan Parkland, 222Na, MN	C

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Beaches Parkland, 222Na, MN	B

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Two selections pending in Manitoba. Wet-mesic variant of this type is extensive in the Tolstoi–Gardenton Macrosite. Good examples of this type occur in the Community Pasture of the same macrosite. A sand subtype is known from Skull Lake WMA, Kittson Co., Minnesota. Further Heritage/CDC Program survey should turn up additional sites.

CEGL002199   G3G4   Northern Wet-Mesic Tallgrass Prairie

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 10
> Data Gaps: In North Dakota, see sites for Great Plains Cordgrass Wet Prairie (CEGL002027). Minnesota Heritage Program does not separate this type from Northern Mesic Tallgrass Prairie (CEGL002202). However, sites selected for the mesic type do contain excellent wet-mesic occurrences, including Bluestem Prairie Macrosite, Tolstoi-Gardenton Macrosite (which may be primarily wet-mesic prairie rather than mesic), Felton Prairie Macrosite, and Pankratz Prairie Macrosite. It may be that Heritage Program review of exisitng element occurrence records and sites in portfolio may demonstrate that this type is sufficiently represented.

CEGL002072   G4   Northern Bur Oak Mesic Forest

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

Spring Grove – Summit, 251Bb, SD	AB
Delta Marsh, 251Aa, MB	B
Pembina Hills, 251Aa, ND	B
Sica Hollow, 251Bb, SD	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 6
> Data Gaps: Possible sites in the Prairie Coteau and Minnesota River Valley. Type should perhaps be managed for woodland condition, see Bur Oak – Aspen Woodland (CEGL002139). Taxonomic review of this type may indicate that ten sites is too high of a goal as this type may have never been common in the presettlement period.

CEGL005205   G4G5   Aspen Parkland Tallgrass Woodland

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 10
> Data Gaps: This type is common and further Heritage/CDC Program survey and documentation should show that many sites in the portfolio already protect this type.

Endemic Distribution, Small-Patch Pattern

CEGL002267 G2 Great Plains Calcareous Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Rothsay Prairie, 251Aa, MN	A
Excelsior Fen Complex, 251Bb, IA	A
Little Sioux River, Lower, 251Be, IA	A
Gully Fens, 222Na, MN	AB
Faith Prairie, 251Aa, MN	AB
Felton Prairie, 251Aa, MN	AB
Waubun Prairies and Fens, 251Aa, MN	AB
Pankratz Prairie, 251Aa, MN	AB
Swedes Forest, 251Ba, MN	B
Spring Grove – Summit, 251Bb, SD	B
Little Sioux River, Upper, 251Bb, IA	B
Crystal Springs, 251Bb, SD	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Chicog Prairie, 251Aa, MN	AB
Des Moines River Valley, 251Bb, MN	B
Sica Hollow, 251Bb, SD	B

> Ecoregional Conservation Goal: 12
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: The small size of many of these sites may warrant additional targets.

CEGL002298 G3? Quartzite – Granite Rock Outcrop

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Blue Mounds, 251Bc, MN	AB
Red Rock Prairie, 251Ba, MN	B
Morton Outcrop, 251Ba, MN	B
Gitchie Manitou, 251Bd, IA	C

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Upper Minnesota River Valley, 251Ba, MN	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 10
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 6
> Data Gaps: Criteria for EO ranking need to be better established. Given the very restricted nature of this type, ten sites may be too high a goal at the outset, but further Heritage/CDC Program survey needs to be completed first.

Limited Distribution, Matrix Pattern

CEGL002062   G4?   North-Central Maple-Basswood Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Sica Hollow, 251Bb, SD   AB

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 6
> Data Gaps: Contact Minnesota Heritage Program for possible sites. Further Minnesota Heritage Program survey of this type is needed. The occurrence at Sica Hollow may better fit with Bur Oak-Basswood Forest (CEGL002012) upon further review.

Limited Distribution, Large-Patch Pattern

CEGL002215   G2   Midwest Dry Gravel Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 7
> Data Gaps: See also sites for Northern Little Bluestem Gravel Prairie (CEGL002499). Distribution of the Midwest Dry Gravel Prairie in this ecoregion is limited to Iowa and needs review since type may actually be peripheral to this ecoregion. It is also present in southeastern Minnesota, eastern Iowa, and other midwestern states.

CEGL002160   G2   Northern Oak Barrens

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Agassiz Dunes, 251Aa, MN   AB

    Twin Lakes Parkland, 222Na, MN   B

    Lake Bronson Parkland, 222Na, MN   B

    Pembina Hills, 251Aa, ND   B

    Hankinson, 251Aa, ND   B

    Sheyenne Delta, 251Ab, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Reserve one site for Manitoba.

CEGL005204   G2G3   Little Bluestem – Porcupine Grass – Grama Grass Sand Prairie

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

      Agassiz Dunes, 251Aa, MN   B

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

      None

Additional A– and B–ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 6
> Data Gaps: Type has been taxonomically confusing, so Heritage/CDC Program information is lacking. Type should be especially common in the Sheyenne Delta.

CEGL002434   G3?   Willow Wet Brush Prairie

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

Beaches Parkland, 222Na, MN	A
Two Rivers Parkland, 222Na, MN	A
Caribou Parkland, 222Na, MN	A
Lake Bronson Parkland, 222Na, MN	AB
Devil's Playground, 222Na, MN	AB
Pelan Parkland, 222Na, MN	AB
Chicog Prairie, 251Aa, MN	BC

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

      None

Additional A– and B–ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Reserve up to three selections in Manitoba.

CEGL002187   G3G4   Dogwood – Mixed Willow Shrub Meadow

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

Barnesville, 251Aa, MN	A
Burnham, 251Aa, MN	B
Sheyenne Delta, 251Ab, ND	B

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

      None

Additional A– and B–ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: All occurrences are the seepage subtype. Consider adding non-seepage occurrences from Manitoba and Minnesota. Type is common. Further Heritage/CDC Program survey is needed.

CEGL002063   G5   Aspen / American Hazel Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Pembina Hills, 251Aa, ND	B
Tolstoi-Gardenton, 222Na, MB	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 5
> Data Gaps: Type is common, but not well documented by Heritage Programs. Many portfolio sites probably contain this type.

Limited Distribution, Small-Patch Pattern

CEGL002273   G?   Northern Great Plains Saline Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Saline Prairie, 251Aa, ND	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 6
> Data Gaps: Type is a survey priority for site identification.

CEGL002255   G2?   Saline Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Shoal Lakes, 222Na, MB	A
Saline Prairie, 251Aa, ND	A
Rothsay Prairie, 251Aa, MN	AB
Atherton WMA, 251Aa, MN	B
Pankratz Prairie, 251Aa, MN	B
Pembina Prairie, 251Aa, MN	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Pembina Prairie WPA, 251Aa, ND	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Felton Prairie, 251Aa, MN	B

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Type is a survey priority for site identification; its GRANK is G2?

CEGL002189   G3   Bog Birch – Willow Prairie Transition Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Gully Fens, 222Na, MN	B
Rosewood, 222Na, MN	B
Sheyenne Delta, 251Ab, ND	B
Spring Grove – Summit, 251Bb, SD	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Ecoregional Conservation Goal: 7
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 3
Data Gaps: Taxonomic questions with community type. Minnesota Heritage Program shrub swamp seepage subtype may fit some stands in other states that are currently placed in this fen type. Type is a survey priority

CEGL002383   G3?   Prairie Transition Rich Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Beaches Parkland, 222Na, MN	A
New Maine, 222Na, MN	A
Rosewood, 222Na, MN	A
New Solum 2, 222Na, MN	B
Caribou Parkland, 222Na, MN	B
Excel 8, 222Na, MN	B
Beju WMA, 251Aa, MN	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

Mentor Prairie, 251Aa, MN	B

Ecoregional Conservation Goal: 7
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
Data Gaps: Poor subsection distribution. Need to pick sites elsewhere in ecoregion, especially 251Ab.

CEGL002081   G4?   Ash-Elm-Mixed Lowland Hardwood Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Rosewood, 222Na, MN   B

    New Maine, 222Na, MN   B

    Pembina Hills, 251Aa, ND   B

    Sheyenne Delta, 251Ab, ND   BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    Turtle River State Park, 251Aa, ND   C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 7
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 3
> Data Gaps: Add Sheyenne Delta Macrosite where at least one good stand is located in Richland Co., North Dakota, near the Sheyenne River. Type needs further survey by Heritage/CDC Programs.

Widespread Distribution, Large-Patch Pattern

CEGL002026   G?   Bulrush-Cattail-Burreed Shallow Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Devil's Playground, 222Na, MN   A

    Hankinson, 251Aa, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Possible sites in the Prairie Coteau. Type is not well documented by state Heritage Programs.

CEGL002088   G?   Great Plains Ash-Elm-Boxelder Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: See also Northern Ash-Elm-Hackberry Floodplain Forest (CEGL002089), which may be similar taxonomically to this type. Clarify taxonomy before picking sites.

CEGL002221   G?   River Bulrush Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

CEGL002018   G3G4   Cottonwood – Black Willow Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

CEGL001475   G3G4   Reed Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Delta Marsh, 251Aa, MB   A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is invasive in much of the ecoregion and needs no conservation targets there; type may be natural in northern portion of ecoregion, particularly in Manitoba.

CEGL002186   G5   Dogwood – Pussy Willow Swamp

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Occurrences are known in and around Caribou WMA and in the Tolstoi-Gardenton Macrosite. Type is common and needs further survey and/or documentation.

CEGL002233   G5   Midwest Cattail Deep Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is often invasive in ecoregion and needs no conservation targets.

CEGL002229   G5   Midwest Mixed Emergent Deep Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

Widespread Distribution, Small-Patch Pattern

CEGL002220   G?   Awned Sedge Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

CEGL002225   G?   Freshwater Bulrush Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

CEGL002314   G?   River Mud Flats

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Defer to aquatic communities (?) since this is a very dynamic type in riverine systems and probably best protected by identifying high quality riverine segments in the ecoregion.

CEGL002258 G4? Tussock Sedge Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

CEGL002262 G4? Water Sedge Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs, and overlaps with Great Plains Calcareous Fen (CEGL002267). Further survey and/or documentation is needed.

CEGL002282 G5Q Midwest Pondweed Submerged Aquatic Wetland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

> Ecoregional Conservation Goal: 4
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 4
> Data Gaps: Type is not well documented by Heritage/CDC Programs. Further survey and/or documentation is needed.

Peripheral Distribution, Matrix Pattern

CEGL002203   G2   Central Mesic Tallgrass Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Consider Schaeffer Prairie (?). Heritage/CDC Program survey and documentation in the geographic border areas of Northern Mesic Tallgrass Prairie (CEGL002202) and this type is needed.

CEGL002025   G2   Loess Tallgrass Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Distribution of this type in the ecoregion needs verification from the Iowa Heritage Program. It may not occur in this ecoregion.

CEGL002037   G3G4   Needle-and-Thread – Blue Grama Mixedgrass Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

      Sheyenne Delta, 251Ab, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

      None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

      None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Further survey work is needed by the Heritage/CDC Programs to determine whether any sites are even possible in the ecoregion.

CEGL002460   G3Q   Northern Mixed Oak/Hazel Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

       None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

       None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

       None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type very peripheral to ecoregion. Evaluate occurrences as part of Prairie-Forest Border Ecoregion.

CEGL002459   G3Q   Northern Mixed Oak/Musclewood Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

       None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

       None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

       None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type very peripheral to ecoregion. Evaluate occurrences as part of Prairie-Forest Border Ecoregion.

CEGL002034   G4   Wheatgrass-Needle-and-Thread Mixedgrass Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

       None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

       None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

       None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is very peripheral to the ecoregion. No known occurrences exist. Heritage/CDC Programs need to establish whether any sites are even possible in the ecoregion.

CEGL002068   G4?   White Oak – Red Oak Dry-Mesic Forest

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

       Dolliver Memorial State Park, 251Be, IA   B

       Ledges State Park, 251Be, IA   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

       None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

       None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Compare with White Oak – Hickory Forest (CEGL002011). Are both in ecoregion? Review taxonomy with Iowa Heritage Program.

CEGL002475   G5   Spruce – Fir – Aspen Forest

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

       New Maine, 222Na, MN   BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

       None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

       None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Minnesota Heritage Program should review this type to see whether any other sites could be expected to be found in the ecoregion.

Peripheral Distribution, Large-Patch Pattern

CEGL002014   G?   Central Green Ash – Elm – Hackberry Forest

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

       None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

       None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

       None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type is mostly south and east of ecoregion. Should occurrences of this type go with Northern Ash – Elm – Hackberry Floodplain Forest (CEGL002089)? Review with Iowa Heritage Program.

CEGL002097   G?   Mixed Aspen Swamp

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Gully Fens, 222Na, MN   AC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    Beaches Parkland, 222Na, MN   E

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Type is mostly sub-boreal. Review with Minnesota Heritage Program to determine possibility of additional sites for this type.

CEGL002089   G?Q   Northern Ash-Elm-Hackberry Floodplain Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    Sheyenne Delta, 251Ab, ND   C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type should probably be treated as widespread, but see Great Plains Ash-Elm-Boxelder Forest (CEGL002088) for a taxonomically similar type.

CEGL002035   G2   Loess Hills Little Bluestem Dry Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Occurrences of this type may not be found in the ecoregion. Review with Iowa and South Dakota Heritage Programs.

CEGL002079   G2?   Paper Birch / Hazel Forest

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

    Pembina Hills, 251Aa, ND   AB

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

    None

Additional A– and B–ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Review possibility of additional sites with North Dakota and Minnesota Heritage Programs.

CEGL002214   G2G3   Midwest Dry-Mesic Prairie

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

    None

Additional A– and B–ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: See sites for Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie (CEGL002377). Type mostly south and east of ecoregion. But maybe type distribution is limited, not peripheral. Taxonomy of type should be reviewed with Iowa Heritage Program before picking sites.

CEGL002011   G2G3   White Oak – Hickory Forest

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

    Dolliver Memorial State Park, 251Be, IA   B

    Ledges State Park, 251Be, IA   B

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

    None

Additional A– and B–ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is mostly southern, but maybe this is a limited type. Review taxonomy with Iowa Heritage Program. See also White Oak – Hickory Dry-Mesic Forest (CEGL002068). Are both in ecoregion?

CEGL000658   G2Q   Cottonwood – Green Ash Floodplain Forest

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Compare type with Cottonwood – Black Willow Forest (CEGL002018). Are both in ecoregion? Review of taxonomy is needed, as well as additional survey.

CEGL002376   G2Q   Northern Plains Transition Bluestem Prairie

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Occurrences should probably be moved to Northern Mesic Tallgrass Prairie (CEGL002202) and this type removed from ecoregion.

CEGL002492   G3   Black Oak / Lupine Barrens

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is very peripheral to ecoregion and probably needs no targets in this ecoregion.

CEGL000556   G3   Bur Oak/Hazelnut Woodland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Distribution of this type needs further review across its entire range, but it is thought only to occur in the Pembina Gorge area of this ecoregion. North Dakota Heritage Program needs to survey and/or document this type. Compare with Bur Oak-Aspen Woodland (CEGL002139).

CEGL001469   G3   Prairie Sandreed – Sand Bluestem Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   Sheyenne Delta, 251Ab, ND   A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Type may only occur in Sheyeen Delta. Review with Heritage/CDC Programs.

CEGL002224   G3?   Central Cordgrass Wet Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

   None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

   None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

   None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Further review with Heritage/CDC Programs will probably lead to elimination of this type from ecoregion.

CEGL002061   G3G4   Central Maple-Basswood Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Ledges State Park, 251Be, IA   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Review with Iowa Heritage Program for possibility of additional sites.

CEGL002142   G3G4   Northern Dry-Mesic Oak Woodland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is very peripheral to ecoregion, no targets needed.

CEGL002265   G3G4   Northern Poor Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Pilot Knob State Preserve, 251Be, IA   A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Taxonomy of poor fens in Iowa needs review before picking another site.

CEGL002105   G4   Black Ash-Mixed Hardwood Swamp

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Gully Fens, 222Na, MN   C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL002071   G4   Red Maple – Ash – Birch Swamp Forest

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

> None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

> None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

> None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL001072   G4   Silver Sagebrush/Western Wheatgrass Shrub Prairie

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

> None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

> None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

> None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type may be so peripheral to ecoregion so as not to warrant any targets. Review distribution with North Dakota and South Dakota Heritage Programs.

CEGL002471   G4   Tamarack Minerotrophic Swamp

Portfolio Selections Meeting Conservation Goals (A– and B-ranked Occurrences)

> Moose River, 222Na, MN   B
> Gully Fens, 222Na, MN   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

> None

Additional A– and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

> None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL001583 G4 Western Wheatgrass – Green Needlegrass Mixedgrass Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Ecoregional Conservation Goal: 2
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
Data Gaps: Type may be so peripheral to ecoregion so as not to warrent any targets. Review distribution with North Dakota and South Dakota Heritage Programs.

CEGL002456 G4 White Cedar – (Mixed Conifer)/Alder Swamp

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Ecoregional Conservation Goal: 2
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL002449 G4 White Cedar – Boreal Conifer Mesic Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Ecoregional Conservation Goal: 0
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL002472 G4? Central Tamarack Poor Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Agassiz NWR, 222Na, MN   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

Ecoregional Conservation Goal: 2
Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL002077   G4?   Northern Pin Oak Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review with Minnesota Heritage Program whether any possibilities of additional sites exist for this type.

CEGL002464   G4?   Paper Birch / Sugar Maple - Mixed Hardwoods Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type may be so peripheral to ecoregion so as not to warrant any targets. Review distribution with North Dakota and South Dakota Heritage Programs.

CEGL002586   G4?   Silver Maple - Elm - (Cottonwood) Forest

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type distribution should probably be changed to widespread, not peripheral. But type needs better survey and documentation by Minnesota Heritage Program.

CEGL002452   G5   Black Spruce / Alder Rich Swamp

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Gully Fens, 222Na, MN	B
Moose River, 222Na, MN	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type may be so peripheral to ecoregion so as not to warrent any targets. Review distribution with North Dakota and South Dakota Heritage Programs.

CEGL002485   G5   Black Spruce Bog

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Agassiz NWR, 222Na, MN	BC
Moose River, 222Na, MN	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type may be so peripheral to ecoregion so as not to warrent any targets. Review distribution with North Dakota and South Dakota Heritage Programs.

CEGL002515   G5   Northern Tamarack Poor Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Type may be so peripheral to ecoregion so as not to warrent any targets. Review distribution with North Dakota and South Dakota Heritage Programs.

CEGL002381   G5?   Speckled Alder Swamp

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Pembina Hills, 251Aa, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Moose River, 222Na, MN   C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Type may be so peripheral to ecoregion so as not to warrant any targets. Review distribution with
> North Dakota and South Dakota Heritage Programs.

CEGL005174   G5Q   Bluejoint Eastern Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Depending on whether this type can be distinguished from Bluejoint-Wooly Sedge Wet Meadow
> (CEGL002254), this type may not occur in ecoregion. Review taxonomy with Minnesota Heritage Program.

Peripheral Distribution, Small-Patch Pattern

CEGL002254   G?   Bluejoint-Wooly Sedge Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Rothsay Prairie, 251Aa, MN   AB

Sheyenne Delta, 251Ab, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Type is possibly widespread in ecoregion, but taxonomy needs rangewide review.

CEGL002227 G ? Bulrush Brackish Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

Ecoregional Conservation Goal: 2 Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2 Data Gaps: Taxonomy of type needs review. Type is probably common, but needs better documentation.

CEGL002581 G ? Saline Spring Mud Flats

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

Ecoregional Conservation Goal: 2 Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2 Data Gaps: Sites meetin

CEGL002183 G ? Saskatoon Serviceberry Shrubland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Pembina Hills, 251Aa, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

Ecoregional Conservation Goal: 2 Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1 Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002294 G ? Shale Barren Slopes

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

Ecoregional Conservation Goal: 2 Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2 Data Gaps: Type is very peripheral to the ecoregion

CEGL002260   G?   Sprangletop Marsh

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    Delta Marsh, 251Aa, MB   BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002004   G2?   Sago Pondweed Submerged Wetland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002318   G2G3   Midwest Dry Sand Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002033   G3   Great Plains Neutral Seep

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

    None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

    None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

    None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL001470 G3 Prairie Sandreed Sand Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

  None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

  None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

  None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Taxonomic issues make site selection difficult. See Prairie Sandreed Grassland (CEGL001469).

CEGL001466 G3 Sand Bluestem – Sedge Sand Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

  None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

  None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

  None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Taxonomic issues make site selection difficult. See Prairie Sandreed Grassland (CEGL001469).

CEGL005139 G3G4 Cinquefoil – Sedge Prairie Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

  None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

  None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

  None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL001798 G4 Foxtail Barley Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

  Saline Prairie, 251Aa, ND   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

  None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

  None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002494 G4G5   Bog Birch Poor Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Agassiz NWR, 222Na, MN   B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 1
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002500 G4G5   Boreal Rich Fen

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002256 G4G5   Lake Sedge Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL001131 G4G5   Wolfberry Shrubland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL002257   G4G5Q   Northern Sedge Wet Meadow

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

  None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

  None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

  None

> Ecoregional Conservation Goal: 0
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 0
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

CEGL001197   G5Q   Sandbar Willow Shrubland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

  None

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

  None

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

  None

> Ecoregional Conservation Goal: 2
> Remaining Sites to be Selected to meet Ecoregional Conservation Goal: 2
> Data Gaps: Review after adjacent ecoregions have completed their planning efforts.

Appendix 8:

Northern Tallgrass Prairie Conservation Design Team

Appendix 8: Northern Tallgrass Prairie Conservation Design Team

THE NATURE CONSERVANCY

Rob McKim, Great Plains Program (Team Leader)
Wayne Ostlie, Great Plains Program (Science Team Leader)
Steve Chaplin, MRO
Kim Chapman, MNFO
Don Faber-Langendoen, MRO
Keith Fletcher, IAFO
Nelson French, MNFO
Jon Haferman, MRO
Gabe Horner, MNFO
Clint Miller, Northern Tallgrass Prairie
Lisa Mueller, MNFO
Karen Poiani, National Stewardship Team
Jane Prohaska, MRO
Gary Reiners, IAFO
Joe Satrom, DKFO
Andy Schollett, DKFO
Jerry Selby, IAFO
Brian Winter, Northern Tallgrass Prairie

HERITAGE/CDC PROGRAMS

Robert Dana, MN NHNR
Jason Greenall, MB CDC
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Darla Lenz, ND NHI
Dave Ode, SD NHDB
John Pearson, IA NAI
Carol Scott, MB CDC

PARTNERS

Peter Buesseler, MN DNR
Gene Fortney, Nature Conservancy Canada
Cathy Johnson, MB DNR
Jane West, USFWS

Appendix 9:

Target Selections by Portfolio Conservation Area

Appendix 9: Target Selections by Portfolio Conservation Area

Report shows targets selected at portfolio conservation areas to meet target conservation goals and additional high quality occurrences; however, it is not an exhaustive list of all targets occurring at each portfolio conservation area.

Conservation Area, Subsection, State/Province

    Site Name

    Element Code   Element Name   Rank

Agassiz Dunes, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002160	Northern Oak Barrens	AB
CEGL005204	Little Bluestem – Porcupine Grass – Grama Grass Sand Prairie	B

Agassiz NWR, 222Na, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002472	Central Tamarack Poor Fen	B
CEGL002485	Black Spruce Bog	BC
CEGL002494	Bog Birch Poor Fen	B

Anderson Prairie – Crimm Savanna, 251Bb, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
PDFAB27090	Prairie Bush-Clover	B

Antelope Hills North and South, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
PPOPH010W0	Prairie Moonwort	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002499	Northern Little Bluestem Gravel Prairie	CD

Aurora Prairie, 251Bc, SD

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002027	Northern Cordgrass Wet Prairie	C
IILEP57010	Powesheik Skipperling	C

Barnesville, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002187	Dogwood – Mixed Willow Shrub Meadow	A
PPOPH010W0	Prairie Moonwort	B

Conservation Area, Subsection, State/Province	
Site Name	
Element Code Element Name	Rank

Blue Mounds, 251Bc, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002298	Quartzite – Granite Rock Outcrop	AB
PMORC1Y0S0	Western Prairie Fringed Orchid	A

Bluestem Prairie, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002202	Northern Mesic Tallgrass Prairie	B
CEGL002499	Northern Little Bluestem Gravel Prairie	B
IILEP57010	Poweshiek Skipperling	AB
IILEPJ6040	Regal Fritillary	A
PMORC1Y0S0	Western Prairie Fringed Orchid	B

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002027	Northern Cordgrass Wet Prairie	AB

Bonanza Prairie SNA, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

PPOPH010W0	Prairie Moonwort	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

IILEP65050	Ottoe Skipper	C

Chanarambie Creek Valley, 251Bb, MN

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002377	Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie	C
IILEP65140	Dakota Skipper	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

IILEP57010	Poweshiek Skipperling	B

Chester Hills, 222Ma, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002499	Northern Little Bluestem Gravel Prairie	B

Cottonwood River Prairies, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

PDFAB27090	Prairie Bush-Clover	A

Crystal Springs, 251Bb, SD

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002267	Great Plains Calcareous Fen	B
CEGL002377	Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie	B
IILEP57010	Poweshiek Skipperling	A
IILEP65140	Dakota Skipper	A
IILEPJ6040	Regal Fritillary	A

Delta Marsh, 251Aa, MB

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL001475	Reed Marsh	A
CEGL002072	Northern Bur Oak Mesic Forest	B
CEGL002260	Sprangletop Marsh	BC

Des Moines River Valley, 251Bb, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002377	Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie	B
PDFAB27090	Prairie Bush-Clover	A

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002267	Great Plains Calcareous Fen	B

Dolliver Memorial State Park, 251Be, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002011	White Oak – Hickory Forest	B
CEGL002068	White Oak – Red Oak Dry-Mesic Forest	B

Excelsior Fen Complex, 251Bb, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002267	Great Plains Calcareous Fen	A

Faith Prairie, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002182	Aspen – Oak Brush Prairie	B
CEGL002267	Great Plains Calcareous Fen	AB

Conservation Area, Subsection, State/Province	
Site Name	
Element Code Element Name	Rank

Felton Prairie, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002202	Northern Mesic Tallgrass Prairie	AB
CEGL002267	Great Plains Calcareous Fen	AB
CEGL002499	Northern Little Bluestem Gravel Prairie	AB
IILEP57010	Poweshiek Skipperling	A
IILEP65140	Dakota Skipper	A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	CD

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002027	Northern Cordgrass Wet Prairie	B
CEGL002255	Saline Wet Meadow	B

Frenchmans Bluff, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002499	Northern Little Bluestem Gravel Prairie	B
PPOPH01150	Frenchman's Bluff Moonwort	A

Gitchie Manitou, 251Bd, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002298	Quartzite - Granite Rock Outcrop	C

Goose Lake Parkland, 222Na, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	B
PMORC1Y0S0	Western Prairie Fringed Orchid	B

Great Bend Prairies, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

PDFAB27090	Prairie Bush-Clover	A

Gully Fens, 222Na, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002097	Mixed Aspen Swamp	AC
CEGL002189	Bog Birch – Willow Prairie Transition Fen	B
CEGL002267	Great Plains Calcareous Fen	AB
CEGL002452	Black Spruce / Alder Rich Swamp	B
CEGL002471	Tamarack Minerotrophic Swamp	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002105	Black Ash – Mixed Hardwood Swamp	C

Hankinson, 251Aa, ND

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002026	Bulrush – Cattail – Burreed Shallow Marsh	B
CEGL002027	Northern Cordgrass Wet Prairie	B
CEGL002160	Northern Oak Barrens	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

IILEP57010	Powesheik Skipperling	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002202	Northern Mesic Tallgrass Prairie	B

Hoffman Prairie State Preserve, 251Be, IA

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

IILEP57010	Powesheik Skipperling	C

Hole-in-the-Mountain, 251Bb, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002012	Bur Oak – Basswood Forest	BC
CEGL002377	Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie	AB
IILEP57010	Powesheik Skipperling	A
IILEP65050	Ottoe Skipper	BC
IILEP65140	Dakota Skipper	A
IILEPJ6040	Regal Fritillary	A
PPOPH010W0	Prairie Moonwort	A

Conservation Area, Subsection, State/Province		
Site Name		
Element Code	Element Name	Rank

Kalsow Prairie State Preserve, 251Be, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002202	Northern Mesic Tallgrass Prairie	C
PMORC1Y0S0	Western Prairie Fringed Orchid	C

Kirchner Prairie, 251Bb, IA

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	C

Ledges State Park, 251Be, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002011	White Oak - Hickory Forest	B
CEGL002061	Central Maple - Basswood Forest	B
CEGL002068	White Oak - Red Oak Dry-Mesic Forest	B

Little Sioux River, Lower, 251Be, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002267	Great Plains Calcareous Fen	A
CEGL002377	Little Bluestem - Porcupine Grass Dry-Mesic Hill Prairie	B

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002158	Northern Bur Oak Openings	C
CEGL002499	Northern Little Bluestem Gravel Prairie	C

Little Sioux River, Upper, 251Bb, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002267	Great Plains Calcareous Fen	B
CEGL002377	Little Bluestem - Porcupine Grass Dry-Mesic Hill Prairie	B
IILEP57010	Poweshiek Skipperling	B
PDFAB27090	Prairie Bush-Clover	A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002499	Northern Little Bluestem Gravel Prairie	C

Mahnomen Prairies, 251Aa, MN

Beju WMA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002182	Aspen – Oak Brush Prairie	B
CEGL002383	Prairie Transition Rich Fen	BC

Wambach WMA, Wambach – Santee Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
IILEP57010	Poweshiek Skipperling	BC

Mehurin 12 and 13, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002499	Northern Little Bluestem Gravel Prairie	B

Moose River, 222Na, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002452	Black Spruce / Alder Rich Swamp	B
CEGL002471	Tamarack Minerotrophic Swamp	B
CEGL002485	Black Spruce Bog	BC

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002381	Speckled Alder Swamp	C

Morton Outcrop, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002298	Quartzite – Granite Rock Outcrop	B

New Maine, 222Na, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

Element Code	Element Name	Rank
CEGL002081	Ash – Elm – Mixed Lowland Hardwood Forest	B
CEGL002383	Prairie Transition Rich Fen	A
CEGL002475	Spruce – Fir – Aspen Forest	BC

Conservation Area, Subsection, State/Province

   Site Name

   Element Code   Element Name   Rank

New Solum - Excel, 222Na, MN

Excel 8

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002383   Prairie Transition Rich Fen   B

New Solum 2

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002383   Prairie Transition Rich Fen   B

Pembina Beach Ridges Prairies, 251Aa, MN

Burnham

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002187	Dogwood - Mixed Willow Shrub Meadow	B
PMORC1Y0S0	Western Prairie Fringed Orchid	B

Chicog Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002434	Willow Wet Brush Prairie	BC
CEGL002499	Northern Little Bluestem Gravel Prairie	B

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002027	Northern Cordgrass Wet Prairie	B
CEGL002267	Great Plains Calcareous Fen	AB

Dugdale WMA

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	C

Godfrey WMA

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	C

Mentor Prairie

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002383	Prairie Transition Rich Fen	B

Pankratz Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002202	Northern Mesic Tallgrass Prairie	AB
CEGL002255	Saline Wet Meadow	B
CEGL002267	Great Plains Calcareous Fen	AB

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002499	Northern Little Bluestem Gravel Prairie	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002027	Northern Cordgrass Wet Prairie	B

Conservation Area, Subsection, State/Province	
Site Name	
Element Code Element Name	Rank

Pembina Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	B
CEGL002255	Saline Wet Meadow	B
PMORC1Y0S0	Western Prairie Fringed Orchid	A

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002202	Northern Mesic Tallgrass Prairie	B

Pembina Hills, 251Aa, ND

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002063	Aspen / American Hazel Forest	B
CEGL002072	Northern Bur Oak Mesic Forest	B
CEGL002079	Paper Birch / Hazel Forest	AB
CEGL002081	Ash - Elm - Mixed Lowland Hardwood Forest	B
CEGL002158	Northern Bur Oak Openings	B
CEGL002160	Northern Oak Barrens	B
CEGL002183	Saskatoon Serviceberry Shrubland	B
CEGL002381	Speckled Alder Swamp	B

Pembina Prairie WPA, 251Aa, ND

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002255	Saline Wet Meadow	C

Pilot Knob State Preserve, 251Be, IA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002265	Northern Poor Fen	A

Pipestone National Monument, 251Bc, MN

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	C

Prairie Coteau SNA, 251Bb, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002377	Little Bluestem - Porcupine Grass Dry-Mesic Hill Prairie	AB
IILEP57010	Poweshiek Skipperling	A
IILEP65140	Dakota Skipper	A

Conservation Area, Subsection, State/Province		
Site Name		
Element Code	Element Name	Rank

Prairie WMA - WPA and Schellberg Prairie, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002202	Northern Mesic Tallgrass Prairie	B

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

IILEP57010	Powesheik Skipperling	B

Red Rock Prairie, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002298	Quartzite - Granite Rock Outcrop	B
PDFAB27090	Prairie Bush-Clover	A

Rosewood, 222Na, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002081	Ash - Elm - Mixed Lowland Hardwood Forest	B
CEGL002189	Bog Birch - Willow Prairie Transition Fen	B
CEGL002383	Prairie Transition Rich Fen	A

Rothsay Prairies, 251Aa, MN

Atherton WMA

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002255	Saline Wet Meadow	B

Rothsay Prairie

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	A
CEGL002254	Bluejoint - Wooly Sedge Wet Meadow	AB
CEGL002255	Saline Wet Meadow	AB
CEGL002267	Great Plains Calcareous Fen	A

Saline Prairie, 251Aa, ND

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL001798	Foxtail Barley Meadow	B
CEGL002255	Saline Wet Meadow	A
CEGL002273	Northern Great Plains Saline Prairie	B

Shaokatan 31, 251Bb, MN

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

IILEP65050	Ottoe Skipper	C

Sheyenne Delta, 251Ab, ND

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL001469	Prairie Sandreed – Sand Bluestem Prairie	A
CEGL002012	Bur Oak – Basswood Forest	B
CEGL002027	Northern Cordgrass Wet Prairie	B
CEGL002037	Needle-and-Thread – Blue Grama Mixedgrass Prairie	B
CEGL002081	Ash – Elm – Mixed Lowland Hardwood Forest	BC
CEGL002160	Northern Oak Barrens	B
CEGL002187	Dogwood – Mixed Willow Shrub Meadow	B
CEGL002189	Bog Birch – Willow Prairie Transition Fen	B
CEGL002202	Northern Mesic Tallgrass Prairie	B
CEGL002254	Bluejoint – Wooly Sedge Wet Meadow	B
IILEP57010	Poweshiek Skipperling	B
IILEP65140	Dakota Skipper	B
PMORC1Y0S0	Western Prairie Fringed Orchid	A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002089	Northern Ash – Elm – Hackberry Floodplain Forest	C

Shoal Lakes, 222Na, MB

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002255	Saline Wet Meadow	A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

ABNNB03070	Piping Plover	C

Sica Hollow, 251Bb, SD

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002012	Bur Oak – Basswood Forest	B
CEGL002062	North-Central Maple – Basswood Forest	AB
CEGL002072	Northern Bur Oak Mesic Forest	B

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002202	Northern Mesic Tallgrass Prairie	B
CEGL002267	Great Plains Calcareous Fen	B

Sioux Prairie, 251Bc, SD

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002202	Northern Mesic Tallgrass Prairie	C

Conservation Area, Subsection, State/Province	
Site Name	
Element Code Element Name	Rank

Spring Grove – Summit – Scarlet Fawn, 251Bb, SD

Scarlet Fawn Prairie

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

IILEP57010	Powesheik Skipperling	A
IILEP65140	Dakota Skipper	A

Spring Grove – Summit

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

CEGL002012	Bur Oak – Basswood Forest	AB
CEGL002072	Northern Bur Oak Mesic Forest	AB
CEGL002189	Bog Birch – Willow Prairie Transition Fen	B
CEGL002202	Northern Mesic Tallgrass Prairie	B
CEGL002267	Great Plains Calcareous Fen	B
CEGL002377	Little Bluestem – Porcupine Grass Dry-Mesic Hill Prairie	B

Steele Prairie State Preserve, 251Bd, IA

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	B

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	BC
CEGL002202	Northern Mesic Tallgrass Prairie	BC

Stinson Prairie State Preserve, 251Be, IA

Portfolio Selections not Meeting Conservation Goals (C–ranked Occurrences)

PDFAB27090	Prairie Bush-Clover	C

Swedes Forest, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A– and B–ranked Occurrences)

CEGL002267	Great Plains Calcareous Fen	B

Conservation Area, Subsection, State/Province

Site Name

ElementCode   ElementName   Rank

Tallgrass Aspen Parklands, 222Na, MB/MN

Beaches Parkland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002383   Prairie Transition Rich Fen   A

CEGL002434   Willow Wet Brush Prairie   A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002097   Mixed Aspen Swamp   E

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002182   Aspen – Oak Brush Prairie   B

Caribou Parkland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002182   Aspen – Oak Brush Prairie   AB

CEGL002383   Prairie Transition Rich Fen   B

CEGL002434   Willow Wet Brush Prairie   A

Devil's Playground

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002026   Bulrush – Cattail – Burreed Shallow Marsh   A

CEGL002182   Aspen – Oak Brush Prairie   B

CEGL002434   Willow Wet Brush Prairie   AB

Lake Bronson Parkland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002160   Northern Oak Barrens   B

CEGL002182   Aspen – Oak Brush Prairie   B

CEGL002434   Willow Wet Brush Prairie   AB

PPOPH010W0   Prairie Moonwort   A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002499   Northern Little Bluestem Gravel Prairie   C

PMORC1Y0S0   Western Prairie Fringed Orchid   C

Pelan Parkland

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002434   Willow Wet Brush Prairie   AB

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002182   Aspen – Oak Brush Prairie   C

Conservation Area, Subsection, State/Province

    Site Name

    Element Code   Element Name   Rank

    Tolstoi-Gardenton

    Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002063	Aspen / American Hazel Forest	BC
CEGL002202	Northern Mesic Tallgrass Prairie	B
PMORC1Y0S0	Western Prairie Fringed Orchid	A

    Twin Lakes Parkland

    Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002160	Northern Oak Barrens	B

    Two Rivers Parkland

    Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002182	Aspen – Oak Brush Prairie	AB
CEGL002434	Willow Wet Brush Prairie	A

Turtle River State Park, 251Aa, ND

    Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002081	Ash – Elm – Mixed Lowland Hardwood Forest	C

Twin Valley Prairies, 251Aa, MN

    Dalby WMA

    Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

PMORC1Y0S0	Western Prairie Fringed Orchid	C

    Twin Valley – Cupido Prairie

    Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	B

Conservation Area, Subsection, State/Province	
Site Name	
Element Code Element Name	Rank

Upper Minnesota River Valley, 251Ba, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002027	Northern Cordgrass Wet Prairie	B
CEGL002202	Northern Mesic Tallgrass Prairie	B
IILEP57010	Poweshiek Skipperling	AB
IILEP65140	Dakota Skipper	B
IILEPJ6040	Regal Fritillary	A
PPOPH010W0	Prairie Moonwort	A

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

ABNFC01010	American White Pelican	C
CEGL002298	Quartzite - Granite Rock Outcrop	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002499	Northern Little Bluestem Gravel Prairie	B

Walls 7 and Windsor 26, 251Aa, MN

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002377	Little Bluestem - Porcupine Grass Dry-Mesic Hill Prairie	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

IILEP57010	Poweshiek Skipperling	BC

Waubay NWR, 251Bb, SD

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

CEGL002158	Northern Bur Oak Openings	C

Additional A- and B-ranked Occurrences in Portfolio not Selected to Meet Conservation Goals

CEGL002202	Northern Mesic Tallgrass Prairie	B

Waubun Prairies and Fens, 251Aa, MN

Portfolio Selections Meeting Conservation Goals (A- and B-ranked Occurrences)

CEGL002267	Great Plains Calcareous Fen	AB

Woodlands - Lake Francis, 222Na, MB

Portfolio Selections not Meeting Conservation Goals (C-ranked Occurrences)

ABNFC01010	American White Pelican	C
CEGL002027	Northern Cordgrass Wet Prairie	C

Appendix 10:

Threats to Biodiversity at Conservation Areas

Appendix 11:

**Potential Multi-Site Threat
Abatement Strategies**

Appendix 11: Potential Multi-Site Threat Abatement Strategies

Stress: Exotic Species

Stressors:
1. Inadequate enforcement of existing state/provincial noxious weed regulations.

2. Local and regional transportation of infected crops along highways, roads and railroads has exacerbated the spread of exotic species.

3. Stocking of nonnative fish species for recreational purposes has caused displacement of native populations.

4. Poor regulation of international shipments has resulted in many species entering the country from other countries.

5. Many state/provincial/federal agencies promote and support the planting of exotic species.

Multi-site Strategies:
1. Work cooperatively with transportation agencies to minimize the threat posed by exotic species plantings in rights-of-way through the enhanced use of native species and elimination of exotic species particularly threatening to natural areas.

2. Work cooperatively with state agriculture technical committees to influence the composition of seed mixtures used on agriculture Conservation Reserve Program lands.

3. As a means of enhancing the use of native species in agricultural and transportation plantings, work to develop commercial sources of native seed as an alternative to exotic species.

4. Coordinate with state/provincial agriculture departments and others on the development and implementation of effective and appropriate biocontrol strategies.

5. Participate on state/province or regional "teams" that promote exotic species education and work to effectively identify and control new exotic species occurrences.

6. Modify existing laws to ban the use of state/provincial/federal funds for exotic species plantings adjacent to natural areas.

7. Work to develop native seed production loan funding to assist in the establishment of commercial sources for native seed.

Stress: Habitat Conversion: Agriculture

Stressors: 1. Federal farm policy coupled with economic realities have been the primary drivers behind the conversion of land to agricultural use.

2. Land is appraised at higher prices if converted to agriculture, regardless of whether it is marginal for that purpose or not.

3. Enhancement of farm technologies has resulted in the ability of farmers to convert and utilize marginal farm land.

Multi-site Strategies: 1. Influence existing farm policy to maintain regulatory programs (e.g., Swampbuster and Sodbuster) that favor the maintenance of natural communities and discourage their conversion. Work cooperatively to maintain and enhance voluntary incentive programs (e.g., NRCS Wetland Reserve Program, Emergency Weland Reserve Program and Environmental Quality Incentive Program) with the same goal.

2. Promote native grasses and forbs as agricultural cash crops.

3. Increase education on the negative impacts of conversion on prairie systems and species.

4. Promote property tax changes that benefit natural areas (e.g., prairie tax exemptions).

5. Initiate or increase funding for state/provincial/federal conservation easement programs which prohibit the conversion of unplowed prairie but permit ecologically-sensitive use of the land (e.g., mowing, haying and the harvesting of seed).

6. Promote an income tax credit as an incentive for donations of habitat conservation easements or the management of natural areas on private lands.

7. Promote revision of the Conservation Reserve Program to allow for habitat-sensitive uses of the land (e.g., mowing, grazing, seed collections) in return for reduced annual payments.

Stress:	Habitat Conversion: Logging
Stressors:	1. Expansion of the pulpwood industry into aspen parkland area as a result of increasing timber prices.
	2. Riverbottom logging and clearing for subsequent agricultural conversion.
Multi-site Strategies:	1. Assess the magnitude and impacts of logging pressure within the forested portions of the ecoregion: tallgrass aspen parkland, Interlake parkland, and riparian areas.
	2. Work cooperatively with state/provincial, federal and private foresters to develop and implement best management practices on forested lands (e.g., Minnesota Forest Resources Council). Incorporate site guidelines into a broader landscape level planning effort.
	3. Hold an ecoregion-wide or regional symposium to identify and discuss the impacts of current logging practices on biodiversity within the forested portions of the ecoregion (in particular the tallgrass aspen parkland).
	4. Develop tax exemption programs for high quality forest or parkland lands.

Stress:	Habitat Conversion: Mining
Stressors:	1. Expansion of gravel mining operations for road and urban construction around the region.
Multi-site Strategies:	1. Develop partnerships with the mining industry to develop mining and prairie preservation plans.
	2. Modify existing state/provincial laws to require counties/municipalities to use a portion of mining revenue for mine reclamation.
	3. Assess the potential of states/province to acquire gravel rights under native prairie.

Stress:	Habitat Conversion: Other
Stressors:	1. Expansion of housing developments in close proximity to urban centers.
Multi-site Strategies:	No multi-site strategies identified.

Stress: Habitat Fragmentation

Stressors: 1. Directly tied to the conversion of native habitats (largely a historical pattern).

2. Federal farm policy coupled with economic realities have been the primary driver behind the conversion of land to agricultural use.

Multi-site Strategies: 1. Influence the revision/implementation of the Conservation Reserve Program and other similar programs to target biologically-sensitive areas as a tool toward increasing buffer and connectivity between natural areas.

2. Assist private landowners with accessing public cost-share funds for habitat protection, restoration and management (e.g., from USFWS, NRCS, BWSR, State/provincial DNR, NRCS RC&D). Advocate for the use of state/provincial funds for landscape level planning to place private lands within a broader context.

3. As a means of enhancing education and public recognition of this threat, work with federal, state/province and nongovernmental agencies/organizations to identify a "poster child" with strong public appeal to carry this message (i.e., grassland birds).

4. Work to enhance appropriations of state/province/federal funds for prairie preservation programs (e.g., Minnesota Prairie Bank).

Stress: Inappropriate Grazing Management

Stressors: 1. In many areas, insufficient grazing land (largely the result of wholesale conversion for agriculture) exists to run an economically viable grazing operation, often resulting in overstocking of remaining pastures.

2. Northern European grazing practices (cattle on small, heavily-grazed pastures) took hold as the cultural norm in the eastern Plains (as opposed to the rangeland culture of the western Plains).

3. The general lack of rangeland management expertise in much of the ecoregion (only available through NRCS in the Dakotas) has made enhancement of currently grazed lands difficult.

Multi-site Strategies: 1. Work cooperatively with the Natural Resources Conservation Service to refine the rating scheme to evaluate rangeland condition.

2. Work with the Natural Resources Conservation Service to facilitate expansion of range managers to the prairies of Minnesota and Iowa. Facilitate transfer of information and expertise across international and state boundaries.

3. Refine Conservation Reserve Program rules and regulations to allow habitat-sensitive grazing of enrolled lands in exchange for reduced payments.

4. Promote the use of conservation easements which protect natural habitats but allow for economic return (e.g., grazing).

5. Develop and promote best management practices for grazing on prairie lands within the ecoregion. Develop a grazing demonstration area for this purpose.

Stress: Loss of the Fire Regime

Stressors: 1. A general negative public attitude toward fire, largely fueled by "Smokey Bear" campaigns, has effectively eliminated fire from the local culture as a management tool.

2. The lack of adequate personnel and financial resources has hindered the ability of management agencies to effectively hire crews and implement effective burn programs.

3. Differences in mission between management agencies (e.g., forestry vs. wildlife management agencies) have resulted in conflicts over appropriate management practices.

4. A lack of training has hindered incorporation of prescribed fire into private and state/provincial/federal lands.

Multi-site Strategies: 1. Work cooperatively with state/provincial and federal agencies to incorporate best management policies that include fire as a preferred management practice.

2. Develop ecologically sensitive management practices to ensure the long-term viability of the natural systems and species. Ensure that the effects of fire are understood and incorporated into any management strategy.

3. Develop good demonstration models of the fire appplication on the landscape as an outreach tool to private individuals and public agencies.

4. Promote and identify strategies to increase funding for stewardship activities within state/provincial/federal agencies (e.g., fire management programs).

5. Work to coordinate fire management effort among state/provincial/federal agencies (i.e., sharing of resources and training) at the regional level.

Stress: Mowing or Haying

Stressors: 1. Long-term mowing or haying of native pastures (particularly year-after-year in the same season) will lead to the loss or reduction of species which normally flower and set seed during that time, shifting composition of the community.

Multi-site Strategies: No multI-site strategies identified.

Stress: Other Hydrologic Change

Stressors: 1. Irrigation and rural/municipal water development has resulted in lowering of surface waters and groundwater tables, negatively impacting aquatic systems and natural communities associated with groundwater.

2. Construction of dams and the subsequent management practices of reservoirs.

Multi-site Strategies: 1. Work cooperatively with U.S. Army Corps of Engineers and other state/provincial agencies in the development of irrigation and flood control projects, and municipal and rural water systems.

2. Increase awareness of the importance of water to natural systems and problems associated with changing water table levels.

Stress: Pesticide Drift/Application

Stressors: 1. Adequate laws have been passed in most areas of the ecoregion, but inadequate funding has made enforcement of regulations difficult.

2. Due to the long history of agriculture conversion, natural areas often lie adjacent to or surrounded by agricultural lands. Insufficient buffer often occurs between these areas.

Multi-site Strategies: 1. Work with state/provincial and federal agencies to enforce existing pesticide regulations.

2. Promote non-chemical control solutions for noxious weeds in native habitats when effective treatments exist.

3. Modify federal/state conservation easement program regulations to allow for acquisition of buffer around protected areas or areas of high biological significance.

Stress: Recreational Use

Stressors: 1. Inappropriate use of motorized vehicles (ATVs, snowmobiles, bikes) and mountain bikes within high quality natural areas.

2. Cutting of hunting lanes within aspen woodlands.

3. Heavy visitation of natural areas and associated physical disturbance.

Multi-site Strategies: No multi-site strategies identified.

Stress: Wetland Drainage

Stressors: 1. State/provincial and federal funds enabled landowners to construct drainage ditches and drain wetlands throughout the ecoregion.

Multi-site Strategies: 1. Advocate for regulatory and voluntary incentive programs that serve to maintain and restore wetlands.

2. Work cooperatively with local watershed districts to modify ditching practices and wetland drainage policies.

3. Establish and maintain links to other conservation organizations already working on this issue.

4. Advocate to change the law relating to the drainage code to allow landowners to opt out of the drainage assessment (to maintain drainage ditches) if they don't want their land drained.

5. Support basic research to detail the benefits of natural wetlands for flood abatement.

Appendix 12:

**Prioritization of Portfolio
Conservation Areas**

Appendix 12: Prioritization of Portfolio Conservation Areas
(With Site Numbers as Appearing in Figure 15)

Very High

Bluestem Prairie (8)

Felton Prairie (19)

Frenchmans Bluff (20)

Pembina Beach Ridges Prairies (39)

Sheyenne Delta (51)

Tallgrass Aspen Parklands (59)

High

Agassiz Dunes (1)

Blue Mounds (7)

Des Moines River Valley (15)

Faith Prairie (18)

Gully Fens (24)

Hole-in-the-Mountain (27)

New Maine (37)

Pembina Hills (40)

Prairie Coteau SNA (44)

Rothsay Prairies (48)

Spring Grove - Summit - Scarlet Fawn (55)

Upper Minnesota River Valley (62)

Moderate

Aurora Prairie (5)

Barnesville (6)

Chanarambie Creek Valley (10)

Chester Hills (11)

Crystal Springs (13)

Delta Marsh (14)

Dolliver Memorial State Park (16)

Goose Lake Parkland (22)

Great Bend Prairies (23)

Hankinson (25)

Ledges State Park (30)

Little Sioux River, Upper (32)

Moose River (35)

Morton Outcrop (36)

New Solum - Excel (38)

Red Rock Prairie (46)

Rosewood (47)

Saline Prairie (49)

Shaokatan 31 (50)

Swedes Forest (58)

Twin Valley Prairies (61)

Waubun Prairies and Fens (65)

Low

Agassiz NWR (2)

Anderson Prairie - Crimm Savanna (3)

Antelope Hills North and South (4)

Bonanza Prairie SNA (9)

Cottonwood River Prairies (12)

Excelsior Fen Complex (17)

Gitchie Manitou (21)

Hoffman Prairie State Preserve (26)

Kalsow Prairie State Preserve (28)

Kirchner Prairie (29)

Little Sioux River, Lower (31)

Mahnomen Prairies (33)

Mehurin 12 and 13 (34)

Pembina Prairie WPA (41)

Pilot Knob State Preserve (42)

Pipestone National Monument (43)

Prairie WMA-WPA and Schellberg Prairie (45)

Shoal Lakes (52)

Sica Hollow (53)

Sioux Prairie (54)

Steele Prairie State Preserve (56)

Stinson Prairie State Preserve (57)

Turtle River State Park (60)

Walls 7 and Windsor 26 (63)

Waubay NWR (64)

Woodlands - Lake Francis (66)

Appendix 13:

Managed Areas (Levels 1-3) by Portfolio Conservation Area

Appendix 13: Managed Areas (Levels 1-3) by Portfolio Conservation Area

Site No.	Conservation Area, Subsection, State Site Name within Conservation Area Managed Area Name within Site	Owner Code	Managed Acres	Site Acres
1	**Agassiz Dunes, 251Aa, MN**			2407
	Agassiz Dunes SNA	CON	396	
			396	
2	**Agassiz NWR, 222Na, MN**			21323
	Agassiz NWR	FFW	21272	
			21272	
3	**Anderson Prairie - Crim Savanna, 251Bb, IA**			361
	Anderson Prairie	SNR	360	
	Crim Savanna WMA	SNR	145	
	Ringham Habitat Area	SCC	80	
			585	
4	**Antelope Hills North and South, 251Ba, MN**			207
	None			
5	**Aurora Prairie, 251Bc, SD**			80
	Aurora Prairie	CON	30	
			30	
6	**Barnesville, 251Aa, MN**			2824
	Barnesville WMA	SNR	1066	
			1066	
0	**Bitter Lake, 251Bb, SD**			6967
	Bitter Lake GPA	SNR	2402	
	Goose Lake GPA	SNR	343	
	Redetzke GPA	SNR	266	
			3011	
7	**Blue Mounds, 251Bc, MN**			2016
	Blue Mounds SP	SNR	1572	
			1572	
8	**Bluestem Prairie, 251Aa, MN**			5019
	Bluestem Prairie SNA	CON	2751	
	Buffalo River SP	SNR	905	
			3656	

9	**Bonanza Prairie SNA, 251Ba, MN**		500
	Bonanza Prairie SNA	SNR	85
			85

10	**Chanarambie Creek Valley, 251Bb, MN**		6521
	Carney Native Prairie Bank	POU	187
			187

11	**Chester Hills, 222Ma, MN**		2349
	None		

12	**Cottonwood River Prairies, 251Ba, MN**		974
	None		

13	**Crystal Springs, 251Bb, SD**		18081
	Briggs Lake GPA	SNR	2
	Crystal Springs	CON	160
	Crystal Springs Ducks Unlimited	CON	1920
	Crystal Springs GPA	SNR	516
	Eilen WPA	FFW	150
	Ketchum Lake GPA-WA	SNR	0
	Mud Lake GPA	SNR	642
	Rush Lake GPA	SNR	318
			3708

14	**Delta Marsh, 251Aa, MB**		37639
	Delta Game Bird Refuge	SNR	2903
	Lake Francis WMA	SNR	13
	St. Ambroise Game Bird Refuge	SNR	10
	U. of M. Field Station – Delta Marsh VPA	SUN	740
	U. of M. Field Station – Delta Marsh VPA (B)	SUN	72
	U. of M. Field Station – Delta Marsh VPA (C)	SUN	636
			4374

15	**Des Moines River Valley, 251Bb, MN**		4258
	Des Moines River Prairie SNA	SNR	154
			154

0	**Dewey's Pasture Complex, 251Bb, IA**		42046
	Barringer Slough WMA/WPA	PMO	1147
	Bluewing Marsh WMA/WPA	PMO	366
	Dan Greene WMA/WPA	PMO	205
	Dewey's Pasture WMA/WPA	PMO	911
	Ducks Unlimited Marsh WMA	SNR	140
	Elk Lake WMA/WPA	PMO	143
	Lost Island Lake WMA	SNR	1179
	Lost Island Marsh WMA	SNR	525
	Round Lake – Clay	SNR	289
	Smith's Slough WMA	SNR	190
	Trumbull Lake WMA	SNR	1037
	Virgin Lake	SNR	114
	Wapiti Marsh WMA	SNR	23
			6269
16	**Dolliver Memorial State Park, 251Be, IA**		600
	Dolliver Memorial SP	SNR	600
			600
0	**Dry Lake, 251Bb, SD**		10337
	Stewart GPA	SNR	1973
	Swan Lake GPA	SNR	1765
			3738
17	**Excelsior Fen Complex, 251Bb, IA**		50
	Dugout Creek WPA	FFW	50
			50
18	**Faith Prairie, 251Aa, MN**		954
	None		
19	**Felton Prairie, 251Aa, MN**		9708
	Blazing Star Prairie SNA	CON	315
	Felton Prairie SNA	SNR	78
	Felton WMA	SNR	801
	Flickertail Prairie WPA	FFW	981
	Fuglie WPA	FFW	624
	Ulen WMA	SNR	390
			3189
20	**Frenchmans Bluff, 251Aa, MN**		140
	Frenchman's Bluff SNA	CON	51
			51

21	**Gitchie Manitou, 251Bd, IA**			91
	Gitchie Manitou	SNR	91	
			91	

22	**Goose Lake Parkland, 222Na, MN**			4350
	Pembina WMA	SNR	1341	
			1341	

23	**Great Bend Prairies, 251Ba, MN**			200
	None			

24	**Gully Fens, 222Na, MN**			4252
	Gully Fen SNA	SNR	499	
			499	

25	**Hankinson, 251Aa, ND**			15812
	Aaser WPA	FFW	320	
	Boldt WPA	FFW	180	
	Elsen WPA	FFW	160	
	Gunness WPA	FFW	160	
	Hartleben WPA	FFW	1218	
	Hentz WPA	FFW	160	
	Lake Elsie NWR	FFW	634	
	Mud Lake WMA	SNR	351	
	Prochner WPA	FFW	80	
	Sheyenne National Grasslands	FFS	2880	
	Stack Slough WMA	SNR	597	
			6740	

0	**Heron Lake, 251Bb, MN**			7316
	Lindgren – Traeger Bird Sanctuary	CON	73	
			73	

26	**Hoffman Prairie State Preserve, 251Be, IA**			37
	Hoffman Prairie	CON	37	
			37	

27	**Hole-in-the-Mountain, 251Bb, MN**			4824
	Altona WMA	SNR	524	
	Hole-in-the-Mountain Prairie	CON	846	
	Hole-in-the-Mountain WMA	SNR	390	
			1760	

0	**Jemmerson - Kettleson Complex, 251Bb, IA**		11854
	Diamond Lake WMA	SNR	265
	Grover's Lake WMA	SNR	353
	Jemmerson Slough WMA/WPA	PMO	758
	Kettleson WMA/WPA	PMO	589
	Marble Lake	SNR	181
	McBreen Marsh WMA	SNR	140
	Welsh Lake WPA	FFW	113
			2399
28	**Kalsow Prairie State Preserve, 251Be, IA**		160
	Kalsow Prairie	SNR	160
			160
0	**Kampeska Lake, 251Bb, SD**		4999
	None		
29	**Kirchner Prairie, 251Bb, IA**		90
	None		
0	**Lake Poinsett, 251Bb, SD**		7808
	Sioux Poinsett GPA	SNR	14
			14
0	**Lake Traverse, 251Ba, MN**		32774
	Diamond Area GPA	SNR	116
	Traverse GPA	SNR	52
	Waldo GPA-WA	SNR	25
	White Rock Dam WMA	SNR	5
	White Rock GPA-WA	SNR	750
			948
30	**Ledges State Park, 251Be, IA**		1200
	Ledges SP	SNR	1200
			1200

31	**Little Sioux River, Lower, 251Be, IA**		133962
	Bertram Reservation	SCC	256
	Dog Creek Park	SCC	37
	Fen Valley WMA	SNR	120
	Hannibal Waterman WA	SCC	39
	Kindlespire Little Sioux Access	SCC	478
	Little Sioux WMA	SNR	203
	McCormack Prairie	SCC	44
	Nelson Access	SCC	39
	Wananta SP	SNR	165
	Waterman Creek WMA	SNR	261
	Wittrock Indian Village	SNR	6
			1648

32	**Little Sioux River, Upper, 251Bb, IA**		15871
	Cayler Prairie	SNR	161
	Freda Haffner	CON	105
	Santee Prairie WPA	FFW	49
	Twin Forks WMA	SNR	67
			382

33	**Mahnomen Prairies, 251Aa, MN**		3254
	Beju WMA		
	Beju WMA	SNR	1534
			1534
	Wambach WMA, Wambach – Santee Prairie		
	Wambach WMA	SNR	442
			442

34	**Mehurin 12 and 13, 251Ba, MN**		431
	None		

0	**Minnesota Lake, 251Ba, MN**		2120
	None		

35	**Moose River, 222Na, MN**		12756
	Theif Lake WMA	SNR	11242
			11242

36	**Morton Outcrop, 251Ba, MN**		40
	None		

37	**New Maine, 222Na, MN**			7155
	New Maine WMA	SNR	297	
			297	
38	**New Solum - Excel, 222Na, MN**			918
	None			
0	**Oak Hammock Marsh WMA, 251Aa, MB**			8850
	Oak Hammock Marsh WMA	SNR	8865	
			8865	
0	**Pelican Lake, 251Bb, SD**			2782
	South Pelican GPA	SNR	8	
			8	
39	**Pembina Beach Ridges Prairies, 251Aa, MN**			18301

Burnham

Burnham WMA	SNR	502
Onstad WMA	SNR	176
Trail WMA	SNR	323
		1001

Chicog Prairie

Chicog WMA	SNR	1633
Melvin Slough WPA	FFW	327
		1960

Dugdale WMA

Dugdale WMA	SNR	1080
		1080

Godfrey WMA

Godfrey WMA	SNR	144
		144

Mentor Prairie

Dalea WMA	SNR	43
Mentor Prairie WMA	SNR	1841
		1884

Pankratz Prairie

Kertsonville WMA	SNR	360
Pankratz Memorial Prairie	CON	798
Tympanuchus WMA	SNR	837
		1995

Pembina Prairie

Pembina Trail Preserve SNA	CON	2315
		2315

40	**Pembina Hills, 251Aa, ND**		92674
	Cavalier County WMA	SNR	537
	Charles V. Pulver WMA	SNR	0
	Icelandic SP	SNR	818
	Jay V. Wessels WMA	SNR	3400
	Pembina Hills WMA	SNR	3819
	Wilbur Allen WMA	SNR	520
			9094
41	**Pembina Prairie WPA, 251Aa, ND**		1354
	Pembina Prairie WPA	FFW	1354
			1354
42	**Pilot Knob State Preserve, 251Be, IA**		369
	Pilot Knob SP	SNR	369
			369
43	**Pipestone National Monument, 251Bc, MN**		284
	Pipestone National Monument	FNP	284
			284
44	**Prairie Coteau SNA, 251Bb, MN**		847
	Buffalo Ridge WMA	SNR	41
	Prairie Coteau SNA	SNR	336
			377
45	**Prairie WMA-WPA and Schellberg Prairie, 251Ba, MN**		1806
	Prairie WMA	SNR	184
	Prairie WPA	FFW	240
			424
46	**Red Rock Prairie, 251Ba, MN**		1450
	Red Rock Prairie	CON	131
			131
0	**Roseau River, 222Na, MN**		62025
	Roseau River WMA	SNR	55665
			55665
47	**Rosewood, 222Na, MN**		4830
	None		

48	**Rothsay Prairies, 251Aa, MN**		9346
	Atherton WMA		
	Atherton WMA	SNR	520
			520
	Rothsay Prairie		
	Anna Gronseth Prairie	CON	1034
	Rothsay WMA	SNR	3430
	Town Hall Prairie	CON	201
			4665
49	**Saline Prairie, 251Aa, ND**		22452
	Ed Bry WMA	SNR	158
	Jeglum WPA	FFW	271
	Kelly's Slough NWR	FFW	1218
	Kelly's Slough WMA	SNR	55
	Kelly's Slough WPA	FFW	625
	Mekinock WPA	FFW	560
	Pender WPA	FFW	560
	Prairie Chicken WMA	SNR	2400
	Stewart Lake WPA	FFW	1285
	Turtle River WPA	FFW	776
			7908
0	**Saylorville Reservoir, 251Be, IA**		5745
	None		
50	**Shaokatan 31, 251Bb, MN**		2240
	None		
51	**Sheyenne Delta, 251Ab, ND**		236179
	Mirror Pool WMA	SNR	665
	Pigeon Point	CON	826
	Sheyenne National Grasslands	FFS	68132
			69623
52	**Shoal Lakes, 222Na, MB**		87314
	Bennett Property VPA	POU	158
	Clematis WMA (A)	SNR	380
	Harperville WMA	SNR	1750
	West Shoal Lake Game Bird Refuge	SNR	27526
			29814

53	**Sica Hollow, 251Bb, SD**			10942
	Sica Hollow GPA	SNR	79	
	Sica Hollow SP	SNR	794	
	Sorbell GPA-WA	SNR	8	
			881	

54	**Sioux Prairie, 251Bc, SD**			200
	Sioux Prairie	CON	200	
			200	

55	**Spring Grove-Summit-Scarlet Fawn, 251Bb, SD**			41822
	Spring Grove-Summit			
	One Road GPA	SNR	57	
			57	

56	**Steele Prairie State Preserve, 251Bd, IA**			200
	Steele Prairie	SNR	200	
			200	

57	**Stinson Prairie State Preserve, 251Be, IA**			32
	Stinson Prairie	SCC	32	
			32	

0	**Swan Lake, 251Ba, MN**			10598
	Swan Lake - Courtland Bay Unit	SNR	8	
	Swan Lake - Hackberry Point Unit	SNR	7	
	Swan Lake - Nicollet Bay WMA	SNR	29	
	Swan Lake - Pehlings WMA	SNR	18	
	Swan Lake - Peterson Lake WMA	SNR	12	
	Swan Lake - Tri Island Unit	SNR	714	
			788	

58	**Swedes Forest, 251Ba, MN**			600
	Swedes Forest, Homme-Kollin Unit SNA	SNR	202	
			202	

59	**Tallgrass Aspen Parklands, 222Na, MB/MN**		**447084**
	Beaches Lake WMA	SNR	24161
	Caribou WMA	SNR	11592
	Devil's Playground WMA	SNR	541
	Gardenton Community Pasture	SAG	13319
	Lake Bronson Prairie Parkland SNA	SNR	189
	Lake Bronson SP	SNR	1484
	Norway Dunes	CON	314
	Pelan WMA	SNR	1796
	Roseau River WMA	SNR	41
	TGP Preserve – MHHC	SOU	996
	TGP Preserve – MNS	CON	837
	TGP Preserve – NCC	CON	1843
	TGP Preserve – PCE	POU	1318
	TGP Preserve – POM	SOU	807
	Twin Lakes WMA	SNR	8062
	Two Rivers Aspen Prairie Parkland SNA	SNR	1292
			68592
0	**Thief Lake, 222Na, MN**		**7775**
	Theif Lake WMA	SNR	13809
			13809
0	**Thielke Lake, 251Ba, MN**		**2038**
	Thielke Lake WMA	SNR	16
			16
60	**Turtle River State Park, 251Aa, ND**		**778**
	Turtle River SP	SNR	778
			778
61	**Twin Valley Prairies, 251Aa, MN**		**3743**
	Dalby WMA		
	Dalby WMA	SNR	120
			120
	Twin Valley – Cupido Prairie		
	Neal WMA	SNR	1254
	Syre WMA	SNR	79
	Twin Valley Prairie SNA	CON	251
	Twin Valley WMA	SNR	887
			2471

62	**Upper Minnesota River Valley, 251Ba, MN**			57277
	Big Stone NWR	FFW	10589	
	Boraas WPA	FFW	97	
	Bucholz WPA	FFW	36	
	Chippewa Prairie	CON	1083	
	Hastad WPA	FFW	771	
	Hegland WPA	FFW	418	
	Lac Qui Parle WMA	SNR	23232	
	Plover Prairie	CON	630	
	Plover WPA	FFW	36	
	Pyramid WMA	SNR	21	
			36913	

63	**Walls 7 and Windsor 26, 251Aa, MN**			1313
	None			

64	**Waubay NWR, 251Bb, SD**			3458
	Waubay NWR	FFW	3458	
			3458	

65	**Waubun Prairies and Fens, 251Aa, MN**			1754
	Waubun WMA	SNR	1754	
			1754	

66	**Woodlands – Lake Francis, 222Na, MB**			67857
	Lake Francis WMA	SNR	15523	
	Portage Community Pasture	SAG	13014	
	St. Ambroise Game Bird Refuge	SNR	14	
	Woodlands Community Pasture	SAG	19986	
			48537	

Owner Code	Owner Code Description	Owner Code	Owner Code Description
CON	Private – Organization – Conservation	PCE	Private – College
FAE	Federal – Army Corps of Engineers	PCN	Private – Corporation
FBR	Federal – Bureau of Reclamation	PIN	Private – Individual
FBS	Federal – Biological Survey	PMO	Multiple Ownership
FDA	Federal – Department of Agriculture	POO	Private – Organization – Other
FDD	Federal – Department of Defense	POU	Private – Other
FFS	Federal – Forest Service	PUU	Unknown/Unrecorded/Private
FFW	Federal – Fish and Wildlife Service	SAG	State/Province – Agriculture
FIA	Federal – Indian Affairs	SCC	Local – City or County
FLM	Federal – Bureau of Land Management	SNR	State/Province – Natural Resources
FNA	Native American	SOU	State/Province – Other
FNO	Federal – NOAA	SRA	Regional – Regulatory Authority
FNP	Federal – Park Service	SRP	Regional – Park
FOT	Federal – Other	STR	State/Province – Transportation
FTR	Federal – Transportation	SUN	State/Province – University