

REINTRODUCING AMERICAN PLAINS BISON TO DAKOTA COUNTY PARKS: A FEASIBILITY STUDY

ABSTRACT

Reintroducing bison could add an important historic component to restoring and managing prairie and oak savanna within Dakota County Parks.

Dakota County Parks
Natural Resources Program



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Executive Summary

For millennia, the prairies of Minnesota and Dakota County were maintained by climate, fire, and grazing. The main grazer and keystone animal of the prairies and savanna were American plains bison (*Bison bison bison*). To date, Dakota County has not utilized grazing in its efforts to restore and manage prairie and oak savanna. The scientific literature documents the numerous beneficial impacts that bison had on these natural communities. Bison could serve as an effective prairie management tool as the County restores and manages prairie within its parks. This report describes the benefits and risks of reintroducing bison, presents the project requirements, including preliminary costs, and analyzes potential sites for reintroducing bison.

Project Purpose

Proposal

The proposal being considered is the reintroduction of a bison herd within the Dakota County Park system.

Goals

The primary goal for reintroducing bison into the County Park system is to help achieve its natural resource goal of establishing diverse, resilient, and sustainable ecosystems, specifically, the prairie ecosystem. A secondary goal for a bison herd is to enhance park visitor experience, providing opportunities to view and learn about bison, the ecosystem that they are a part of, and the strong historical relationship that the animal had with the Native American culture of the area.

Principles

A bison reintroduction project is based on the following natural resource principles as presented in the Natural Resource Management System Plan.

- Natural resources and natural communities exist as interrelated, dynamic systems that have developed over thousands of years.
- Natural areas and habitat have been significantly lost, fragmented and degraded.
- Natural processes have been disrupted, resulting in degradation (diminished function and reduced benefits).
- Natural resource management is necessary to halt and reverse the trends of degradation.
- Biodiversity is an important measure of site quality, community resilience and biotic potential

Benefits

There are numerous benefits to reintroducing bison within the County's park system. These benefits can be categorized in two areas, ecological and visitor services:

Ecological



Bison promote biodiversity through multiple mechanisms. Bison feed selectively on dominant grasses and focus their grazing in patches. Forbs that might otherwise lose the competition for light against dominant grasses get a chance to grow. Bison play a unique role in seed dispersal by actively and passively spreading seeds. The composition of species found inside bison wallows can vary greatly from the surrounding prairie. By boosting diversity in plant communities, bison grazing may enhance ecosystem function and stability, a key goal for natural resources within the County Park system (see page 14 for additional information on the ecological benefits).

Visitor Services.

Bison are charismatic animals that will attract additional visitors, providing opportunities to learn about the park, the rare prairie ecosystem and this large native animal that no longer roams the landscape. These benefits are aligned with the goals presented in the Parks Visitor Services Plan system (see page 20 for additional information on the visitor service benefits).

Recommendations

Based on the conclusions found in the feasibility study, the most viable option for bison reintroduction is Spring Lake Park Reserve. This park could provide a bison range of approximately 150 contiguous acres of prairie, creating habitat for a year-round 30 bison herd that is procured at no cost in partnership with the Minnesota Bison Conservation Herd Partnership. The recommendation is based on the park's location and numerous access points to the proposed range that make monitoring and management both efficient and effective. Electricity and water sources are available for the bison-required infrastructure. The eastern section of the proposed range would provide an ideal location for the animal handling facility. It is secluded and has an access road to it. There is infrastructure to accommodate visitors, including parking, restrooms and the regional greenway.

Two site concepts are presented for a bison range at this park. Concept One (Figure ES 1) is approximately 150 acres in size and would allow the bison to roam freely through the range. Concept Two (Figure ES 2), is approximately 141 acres in size, utilizes a three-paddock system, which would require moving the bison between paddocks. If bison are reintroduced, they will be improving 83% of the prairie in the park.

The Metropolitan Regional Park Policy Plan designates park reserves (such as Spring Lake Park Reserve) as units of larger acreage of which 80% is required to be managed as natural lands that protect the ecologic function of the native landscape. Bison fit well into the park reserve protection and stewardship policy objectives. The Policy Plan further states that park reserves serve a diversity of outdoor recreation needs. The reintroduction of bison will provide park visitors enhanced outdoor recreation and education opportunities.

The bison range as depicted in both conceptual models are compatible with the adopted 2005 Spring Lake Park Reserve Master Plan. The plan illustrates several visitor service capital improvements in the vicinity, but outside of the conceptual bison range. These include an archery range, the Village, lodge, and group camp. The proximity of the bison to these visitor service improvements add value and enhance experience for park visitors. A Master Plan update for SLPR was initiated in 2019 and will be



brought to the County Board in 2020 for adoption. If the County Board directs staff to proceed with a bison project within this park, the new Master Plan will incorporate and plan for the bison herd.

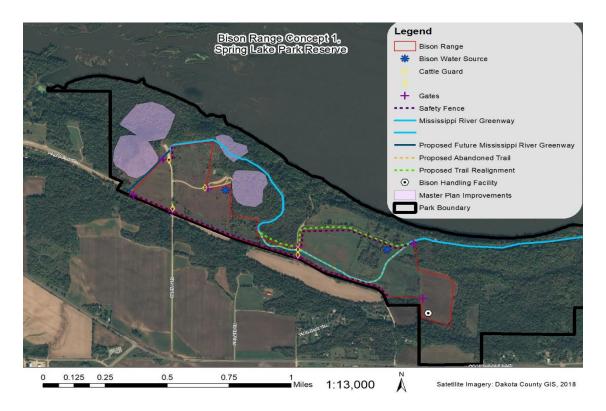


FIGURE ES 1. PROPOSED SLPR BISON RANGE - CONCEPT ONE

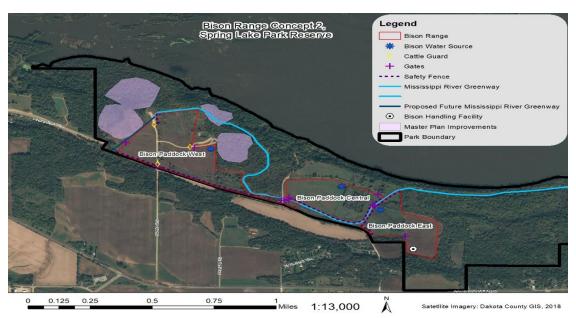


FIGURE ES 2. PROPOSED SLPR BISON RANGE - CONCEPT TWO



Project Requirements

There are three project requirement categories: bison, containment, and visitor services.

Bison

There are two options for obtaining bison; there is the possibility of contracting with a private entity to provide the County with bison for a few months during the growing season, or the recommended alternative where the County could join the Minnesota Bison Conservation Herd partnership (MBCHP), which would provide it with bison obtained from this herd (see page 50 for additional information). To maintain a healthy and content bison herd, proper nutrition and water must be available. SLPR contains the required prairie and existing wells can provide water.

Containment

The fencing design that is being recommended is made up of five-strand high tensile wire, with approximately 12 inches between strands for a total fence height of six feet. This fencing will run the perimeter of the bison range. In addition, there will be a second fence inside the perimeter fence at certain locations where there is a risk of people coming into contact with the bison by reaching inside of the perimeter fence (see page 53 for additional information).

Visitor Services

The Visitor Services Plan highlights the desire to provide greater environmental awareness, discovery, and understanding for park visitors and to increase the number of people visiting the County parks. A bison herd would be a unique educational asset that can help tell the story of the County's historic natural communities, ecological concepts, and the rich Native American culture that has been in this area for thousands of years. The SLPR contains trails, parking lots, restrooms, & picnicking facilities to accommodate people who visit the park to view and learn about the bison (see page 69 for additional information).

Operation / Capital Expenses and Funding

Capital Expenses. The following table presents preliminary capital costs for the bison-related project components for each SLPR concept, based on the draft site ranges presented and on the method of bison procurement.

												Total bison
											Total bison	related
											related	infrastructure
											infrastructure	without
					Handling						w/ handling	handling
					facility						facility	facility
	Bison	Bison	Total		including					Greenway	(includes 25%	(includes 25%
	fence -	fence -	perimeter		squeeze		Cattle guard	Water	Storage	realignment	inflation and	inflation and
	primary	safety	fencing	corral	shoot	Gates	for roads	provision	building	expense	contingency)	contingency)
Site												
SLPR - Concept												
One	\$36,216	\$18,612	\$ 54,828	\$5,000	\$ 400,000	\$5,850	\$ 39,000	\$ 19,100	\$14,000	\$ 577,000	\$ 1,393,472	\$ 893,472
SLPR - Concept												
Two	\$40,543	\$13,214	\$ 53,757	\$5,000	\$ 400,000	\$7,150	\$ 23,400	\$ 33,300	\$14,000		\$ 670,607	\$ 170,607

TABLE ES 1. ESTIMATED BISON CAPITAL INFRASTRUCTURE COSTS PER SLPR CONCEPT



Capital Funding

There are two legislative bodies that could recommend funding for a bison project. The Legislative-Citizen Commission on Minnesota Resources (LCCMR) provides funding recommendations to the legislature for environment and natural resource projects.

The second legislative body is the Lessard-Sams Outdoor Heritage Council (LSOHC) which recommends projects for funding from the Outdoor Heritage Fund. (See page 65 for additional information)

Possible County revenue sources include Environmental Legacy Fund (ELF) and Park Fund.

Operational Expenses

Staffing. It is anticipated a .5 FTE will be needed to manage herd-related activities, which would be an expense of \$47,312 (salary, benefits, computer, phone stipend).

Equipment supplies and services. Once established, a bison herd is relatively self-sufficient and minimal inputs are required. Approximate annual expenses are calculated at \$7,250.

Total annual operating expenses would come to \$54,562, with the addition of onetime expenses for project design, engineering, administration and inspection (see page 65 for additional information).

Potential Operational Funding

- Parks and Trails Legacy Fund
- Metropolitan Council Operations and Maintenance
- Environmental Legacy Fund (ELF)
- Fee based revenue funding
- Dakota County levy

Potential Partnerships

A bison project at SLPR could provide an opportunity to partner with other organizations.

Minnesota Bison Conservation Herd Partnership (MBCHP). This partnership is made up of the Minnesota Department of Natural Resources and the Minnesota Zoo. As a partner in this effort, Dakota County would receive bison offspring from other sites in the partnership that have no detectable cattle genes. The bison would become a permanent component of the prairie and the park and would be on-site 12 months of the year, providing greater ecological benefits and year-round opportunities for viewing and interpretive programs. As a partner, Dakota County would receive bison at no cost. In addition, the other partners would bring expertise to the County's design refinement process and could provide herd management consulting. A State grant proposal may be looked upon more favorably if Dakota County was helping the MBCHP to achieve its State-wide goals.



Corporate Sponsorship. There may be an opportunity to attract a corporate sponsor or donation for Capital and operational expenses associated with a bison project.

Risks Assessment

The Office of Risk Management led an Enterprise Risk Management (ERM) process to identify potential positive and negative risks associated with a bison reintroduction project. A group of internal and external stakeholders and content experts participated in two workshops and identified 31 potential individual risks and opportunities within four risk categories: 1) Public, 2) Park Facilities, 3) Staff, and 4) Bison. The treatments identified for each of the risks will be used in the design refinement and operational planning process to minimize these risks (see page 47 for additional information on the ERM process).

Next Steps

Subject to the Dakota County Board of Commissioners direction to advance bison reintroduction at Spring Lake Park Reserve, the following are the recommended next steps:

- 1. Staff will refine the design for the bison range and develop an updated capital cost estimate.
- 2. Staff will design associated visitor service improvements including an associated cost estimate.
- 3. Staff will develop an implementation plan, a bison owner's/operational manual, and a safety manual.
- 4. Staff will contact the Minnesota Bison Conservation Herd Partnership to understand the associated partnership terms and responsibilities of the County
- 5. Staff will prepare and submit grant proposal(s) to the Legislative-Citizen Commission on Minnesota Resources and Lessard-Sams Outdoor Heritage Council.
- 6. Staff will conduct a public engagement process to solicit project input.
- 7. Staff will return to the Board at a future meeting with an update to the items above.



Reintroducing American Plains Bison to Dakota County Parks:

A Feasibility Study



"Nothing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed. It is a many faceted treasure, of value to scholars, scientists, and nature lovers alike, and it forms a vital part of the heritage we all share as Americans."

PRESIDENT RICHARD NIXON—STATEMENT UPON SIGNING THE ENDANGERED SPECIES ACT, DECEMBER 28, 1973



Introduction

On January 22, 2019, the Dakota County Board of Commissioners authorized a feasibility study for reintroducing American plains bison (*Bison bison bison*) to the County park system (#19-037). The idea of reintroducing a historic megafaunal species, bison, is being proposed as a component of the County's broader efforts to restore and manage heritage natural communities in the park system, as presented in the Natural Resource Management System Plan.

A Missing Piece

For millennia, Dakota County consisted of vast expanses of prairie grasslands interspersed with periodic interruptions of wetlands, islands of oak savanna, and pockets of big woods forest. Prior to European immigrant settlement, Dakota County contained approximately 300,000 acres of prairie and savanna, consisting of roughly 80 percent of the county. Historically, these communities were disturbance-driven, primarily by three interacting drivers: climate, fire, and grazing. The interaction of these drivers resulted in a mosaic of heterogeneous prairie and savanna plant species and communities across the Dakota County landscape. The diversity of plants, in turn, provided the necessary habitat for a myriad number of animal species, resulting in diverse, resilient, and sustainable ecosystems.

However, most of the County's original prairie and savanna have been lost—a trend echoed across the state. Minnesota retains less than two percent of its original 18 million acres of native prairie and prairie complexes, of which very little is legally protected through conservation ownership or easements (Marschner, F.J. 1974, MNDNR 2018). Fire suppression, land conversion, and extirpation of keystone species are the main drivers of tallgrass prairie decline in the Midwest (Sampson and Knopf 1994). Recreating and managing these ecosystems is the goal of much of the restoration activities of Dakota County.

Reintroducing and utilizing the important ecosystem drivers are key to maximizing the success of the prairie and oak savanna restoration taking place in the parks. Climate is ever present, if in a state of flux, and fire has been reintroduced as a management tool. The one driver that is currently missing is grazing.

An Opportunity

Prairie is primarily a disturbance-driven landscape with three key interacting drivers: climate, fire, and grazing (Steinauer and Collins 1996). This disturbance regime—and its impact on landscape structure and function—provides land managers with key information on how to restore native prairie. Climate determines growing season length, moisture availability, and temperature range. This dictates locations (e.g., Dakota County) where prairies can exist—generally under conditions too dry for forests, yet too wet for deserts. Fires favor grassland over forest by suppressing successional encroachment of woody plants. Fire has been used both historically by indigenous people and contemporarily by natural resource practitioners to manage prairies. Periodic fires mimic historic conditions in southeast Minnesota, where drier weather and westerly winds produced seasonal fires. Lastly, grazing produces a unique suite of biotic and abiotic effects such as plant species composition, animal-mediated seed dispersal, and spatial heterogeneity (Knapp et al. 1999).



Maximizing the ecological benefits and financial investments in habitat restoration will be greatly enhanced if each of the main drivers are present. Reintroducing grazing disturbances would create a more complete set of tools for the County's natural resource restoration and management efforts.

Bison were the dominant grazers in North American tallgrass prairies prior to European settlement. An estimated 30–60 million bison (Flores 1991, Shaw 1995) occupied the North American Great Plains prior to the arrival of European Americans, and the cumulative effect of their grazing patterns were instrumental in the maintenance of prairie vegetation. Bison were also culturally important to the indigenous people, who managed the landscape in concert with wildlife grazing patterns (Kimmerer and Lake 2001).

The bison population declined during the nineteenth century in the face of slaughter by European settlers for food, hide, and sport (Isenberg 2000). The bison population was reduced to fewer than 1,000 individuals in the late 1880s. Conservation efforts and commercial ranch operations have returned that number to around 500,000 bison within public and private herds today. However, genetic testing estimates the number of "genetically pure" bison (i.e., those free of cattle gene introgression) to be around 15,000 (Mersey 2017).

Over the last century, nonprofit and public organizations have reestablished and sustained bison herds throughout the Great Plains states. Management goals vary among organizations: some aim to conserve the species while others use bison as a tool for habitat restoration. However, these two goals are not mutually exclusive. For example, the Minnesota Conservation Herd brings together a growing set of partners under the banner goals to "manage and interpret bison as a natural resource, as part of the prairie ecosystem" and "contribute to the overall conservation of American Plains bison" (MNDNR 2016). As the number of herds grows, so does the network of organizations with expertise and resources for bison management.

Empirically-based knowledge of bison grazing within prairie ecosystems informs adaptive management and continues to evolve. This review will highlight some fundamental ways in which bison alter the physical and biological environment, leading to changes in plant and animal composition as well as spatial heterogeneity. In addition, these beneficial effects will be placed in the context of creating diverse, resilient, and sustainable prairies—a principle goal for Dakota County.

Grazing. Grazing by bison promotes biodiversity through multiple mechanisms. Bison feed selectively on dominant grasses (Coppedge et al. 1998, Hartnett et al. 1996) and focus their grazing in patches (Coppedge and Shaw 1998). In recently grazed areas, forbs that might otherwise lose the competition for light against dominant grasses get a chance to grow (Collins et al. 1998). Meanwhile, grasses recover between grazing events and persist in ungrazed areas. The result is a heterogeneous landscape with a diverse collection of vegetation.

Reestablishment of bison grazing has been shown to reverse the diversity loss from frequent burning regimes (Collins et al. 1998). Management techniques that incorporate both fire and grazing by bison have been successfully implemented. For example, patch-burn grazing encourages landscape heterogeneity through varied grazing intensities (Weir et al. 2013). In this regime, a portion of the



prairie is burned on a rotating schedule, while post-fire regrowth attracts bison to the burned areas (Allred et al. 2011).

By boosting diversity in plant communities, bison grazing may enhance ecosystem function and stability. Grassland experiments at Cedar Creek Ecosystem Science Reserve in Isanti County, MN indicate that plant diversity increases ecosystem productivity via niche complementarity (Tilman et al 2001). Furthermore, data across Europe and North America show that grassland diversity bolsters the resistance of productivity to change in the face of climate extremes (Isbell et al. 2015). Resistance to change complements resilience (recovery from change) to maintain ecosystem function through time.

Movement and Seed Dispersal. As bison move throughout the prairie for grazing and other behaviors, they play a unique role in seed dispersal by actively and passively spreading seeds. Although the potential dispersal distance of prairie species is highly variable, it tends to be a relatively short distance from the parent plant (Okube & Levin, 1989; Wilson, 1993). Long-distance dispersal over 100 meters is less common and requires specific vectors, such as high-wind events or wide-ranging herbivores. Bison mediate seed dispersal of graminoids and forbs through entanglement with their fur or via digestion (Rosas et al. 2008). Moreover, many seeds adapted for abiotic modes of transportation (e.g., wind) disperse further in the presence of large animals, such as bison (Nathan et al. 2008).

Long-range movement of seeds by bison has implications for species diversity and resilience. For example, the natural movement of prairie species from high-quality remnant to lower-quality restored areas (also known as "spillover") promotes greater biodiversity. Researchers in western Minnesota found that the ability of seeds to travel further resulted in a higher chance of spillover (Sperry et al. 2019). Dakota County has facilitated movement of seeds from remnant to restored areas with volunteer efforts, which can be labor intensive and target only ripe plants at the time of volunteer/staff harvest. However, bison-mediated dispersal could accomplish similar results and occur passively throughout the seed ripening season. Spreading seeds to varied locations in the prairie increases the resilience of species by promoting their proximal occurrence when locally unfavorable conditions arise.

Timing and species type also influence seed dispersal efficacy by bison. A study of hair samples clipped from bison at Neal Smith Wildlife refuge showed much higher forb seeds per hair sample than graminoids. Also, they estimate that an average adult female bison carries ~11,000 seeds each fall, about half of which would detach over the winter, leading to bison-mediated frost seeding. Annual shedding of fur, as well as wallowing, aides in deposition of the remaining seeds during the spring and summer seasons (Eyheralde 2015).

Wallowing. Wallowing by bison—essentially, rolling around in the dirt—is a behavioral adaptation that deters biting insects, removes molted fur, displays strength during the rut, and enhances thermoregulation (McMillan et al. 2000; Lott 2002). Wallowing exposes and compacts soil over an average area of about 15 feet across by one foot deep. It is estimated that 100 million of these "wallows" could be found across the landscape prior to European settlement (McMillan et al. 2011).

The composition of species found inside wallows can vary greatly from the surrounding prairie (Polley and Collins 1984). Exposed soil promotes the growth of early stage species that might otherwise be



outcompeted by surrounding tall vegetation and litter, while soil compaction allows water to collect in the spring. A study of wallow vegetation at Konza Prairie Biological Station found that 16 percent of plant species at the site occurred only in wallows (McMillan et al. 2011). These disturbed microsites not only promote local plant diversity but also increase heterogeneity across the prairie (Collins and Barber 1985, Hartnett et al. 1997).

Cascading Effects. Through their unique behaviors, bison fulfill the niche of a keystone species in prairie ecosystems—having a proportionally greater impact on other components of the prairie compared to other species. Both trophic (e.g., grazing) and non-trophic (e.g., wallowing) behaviors by bison often result in a more optimal environment for other species. This can lead to a cascading effect, in which the increased abundance and diversity of one component generates an overall net benefit for another.

Arthropods, which include insects and spiders, play an important role in prairie ecosystems, have been shown to benefit from the presence of bison. Nickell et al. (2018) found that after wallows were abandoned and vegetation re-established, the altered vegetation structure lead to higher species richness for some arthropod groups. Moran (2014) reported herbivorous arthropod populations to be three times higher in grazed plots than control plots. Arthropod abundance in turn supports the dietary needs of many bird, small mammal, and amphibian species.

Grassland and shrubland songbird species benefit not only from increased food supply that include the abundance of arthropods but also from the resulting landscape diversity created by bison grazing. Bird species that utilize grassland during their life history (e.g., for nesting or foraging sites) respond to differences in vegetation structure (Fisher & Davis 2010, Saab et al. 1995). As birds seek optimal habitat, areas with higher heterogeneity may support more species (Hovick et al. 2014).

Bison Versus Cattle. The possibility of reintroducing bison for restoring and maintaining prairie raises the question of whether alternate grazers would suffice. Cattle (*Bos taurus*) are often perceived as fulfilling the same ecological niche as bison. However, key differences separate the two as potential candidates for maintaining a diverse, sustainable, and resilient prairie. Several behaviors exhibited by bison, which lead to greater biodiversity and heterogeneity, are not seen with cattle. These include wallowing, forage preference, and cold tolerance (Hartnett et al. 1997). Another difference pertains to risk of soil and wetland erosion—a common concern with grazing. Cattle are reported to spend more time in floodplains and other wetland complexes (Smith et. al. 1992, Goodman et. al. 1989), while bison use water more efficiently and prefer upland areas (Steuter 1995). Mitigating the risk of wetland degradation by cattle through added infrastructure can prove costly (Holechek 1999), which reduces the economic sustainability of that approach.

Outlook. This review has focused on the ecological benefits of bison, which are only part of the equation. To make sound management decisions and gain public interest, agencies that manage public herds consider the ecological, social, and economic impacts of reintroduction. These three components align with prominent frameworks of sustainability (Gibson 2006). Furthermore, promoting sustainability is noted as a guiding principle of Dakota County's 2030 Park System Plan (Dakota County Office of Planning 2008).



Based on the growing body of research illustrating the benefits of bison on prairie systems, bison reintroduction would return a missing component of the landscape. When used in concert with other management tools, bison would help restore diverse, sustainable, and resilient prairies to Dakota County. Furthermore, reuniting a native keystone species to a native biome presents unique opportunities for educational programming, as well as academic and organizational partnerships. These potential social and economic implications of reintroducing bison are reviewed in the benchmarking portion of this feasibility study.

The scientific literature provides information on the role that bison play in the life of the prairie and its potential benefits as a tool in the County's natural resource restoration and management activities. The next section will examine existing pertinent County plans and documents to determine if they support the concept of bison reintroduction.

The Institutional Foundation for Reintroducing Bison

Land use changes and the introduction of non-native species have greatly reduced, altered, and simplified Dakota County's natural communities and with it the loss of important ecological services and functions. As a result, restoration and management are required to reverse this trend by improving biodiversity and returning the natural processes that were integral to the sustainability of the County's historic natural ecosystems.

Dakota County has made great strides in restoring and managing its parks. Current activities that control exotic invasive species and that install native plants are designed to increase the diversity of native species in the parks. Identifying and ensuring that the historic natural processes are present is also an important piece of the natural resource improvement puzzle. Historically, there were three main process drivers that maintained the County's ecosystems. Precipitation, drought, wind, and other climatic attributes served to provide new disturbances and conditions that were constant components of native ecosystems.

Another important driver of the prairie and savanna systems in Dakota County was fire. County Natural Resource staff utilize fire as a management tool in all the parks in the effort to recreate the original conditions that supported these natural systems. Fire kills encroaching woody plants, removes built up thatch, exposes mineral soil for seed germination, and returns nutrients to the soil for use by growing plants.

A third historic process was grazing, which has not yet been reintroduced or utilized as a prairie management tool. The scientific literature, presented in the opportunity section of the Introduction, provides evidence that reintroducing bison, which once roamed the prairies and savannas of Minnesota and Dakota County, would be another effective tool in driving these natural communities toward the desired future of diverse, resilient, and sustainable systems.



The Natural Resource Management System Plan (NRMSP) presented information on how the natural resources within the County parks got to the current state. It also provided a desired future and the principles, goals, and activities to arrive at this future. To be successful, County natural resource practitioners need a large array of approaches and tools to restore and manage these complex natural systems. Bison, through their grazing, wallowing, rubbing and other behaviors, can assist staff in achieving diverse and resilient prairies and savannas and in achieving the vision of the NRMSP.

There are several foundational and adopted documents which support the strategy of reintroducing bison to Dakota County. With documents like the parks mission statement, the NRMSP, and the Visitor Services Plan, a case can be made that the reintroduction of bison can further both the mission and the goals of the Dakota County Parks Department. The following are taken directly from existing documents:

Dakota County Parks Mission:

To enrich lives by providing high quality recreation and education opportunities in harmony with natural resource preservation and stewardship

Natural Resource Management System Plan

One of the service provisions of the Dakota County Parks Department is to realize the vision that was developed for the Natural Resource Management System Plan (NRMSP). It was adopted by the Dakota County Board of Commissioners in 2017 and serves as the natural resource guide for County staff. The plan states the following:

The water, vegetation, and wildlife of Dakota County parks, greenways, and easements will be managed to **conserve biodiversity**, **restore native habitats**, **improve public benefits**, **and achieve resilience** [emphasis added] and regionally outstanding quality, now and for future generations. (p. 3)

The NRMSP presents several principles, goals, and activities that support both the vision and the idea of reintroducing grazing generally and bison specifically to the park system.

4.1 Natural Resource Management.

A strong commitment is made to stewarding and improving natural communities:

Good stewardship includes maintaining, enhancing and restoring ecosystems [emphasis added] to be well-suited to local conditions to ensure that plants and animals have the greatest chance of surviving. The County has been and will continue to promote ecological restoration to ensure natural resources are managed well. (p.29)

4.4 Long-term Management.



This section identifies the importance of disturbance within ecosystems and while it lands somewhat short of recommending grazing, it acknowledges it as a disturbance mechanism.

Typical long-term management tasks include spot-herbiciding of invasive plants, reseeding disturbed or poorly developing areas, re-planting woody plants that have died, and maintaining appropriate ecosystem disturbances to perpetuate a diverse and resilient plant community. Most ecosystems need some type of disturbance that removes dead plant material, regenerates many plant species, and opens up new habitats for plants and animals to perpetuate themselves or to maintain diversity. Controlled burns in fire-dependent communities (prairies, savannas, wetlands, and some woodlands), which mimic wildfire, are a common tool to achieve this objective. Harvesting hay from prairies, which mimics grazing, can also be effective [emphasis added]. (p.32)

As discussed in the previous section, the scientific literature identifies bison and their behavior as an important disturbance driver for prairies and savannas.

The NRMSP presents principles and goals that support the idea of utilizing all available methods to improve the ecological health of the parks, including grazing. Those that pertain to the issue addressed in this study are included below.

10.1. Principles

10.1.1. Foundational Principles of Natural Resources Management

Foundational natural resource management principles include [in part]:

- Natural areas and habitat have been significantly lost, fragmented and degraded.
- Natural processes have been disrupted, resulting in degradation (diminished function and reduced benefits).
- Natural resource management is necessary to halt and reverse the trends of degradation.
- Biodiversity is an important measure of site quality, community resilience and biotic potential. (p. 92)

10.3 Goals

10.3.1. Vegetation Management Goals in Parks [in part]

- Follow best management practices and latest scientific methods to achieve success
- Maintain vegetation perpetually in restored areas (p.93)

11.3.1.3. Maintain All Existing and Newly Restored Areas

In order to protect natural resources investments already made, the County will provide perpetual management for all existing and newly restored County natural areas... If forb diversity is too low, take steps to increase forb diversity. (p.103)

11.4. Implementing tier 2 management



While Tier 1 activities are the County's top priorities for natural resource management (Section 11.3), Tier 2 represents other important activities that will help achieve the longer-term goals of this NRMSP. (p.113)

11.4.3. Tier 2 Wildlife Management in Parks

Wildlife management will focus on collaboration with partners to protect and manage habitat outside County lands, expansion of wildlife studies, **beginning species re-introductions** [emphasis added], and continued wildlife monitoring. (p.113)

Table 24. Tier 2 Wildlife Management in Parks.

- Work with partners and owners of adjacent or large nearby natural areas to protect and manage habitat outside of parks
- Expand wildlife studies to include other important species
- Re-introduce select wildlife species that are not currently living in parks but once did [emphasis added]
- Continue wildlife monitoring programs (p.113)

Summary of Relevance to the NRMSP. The NRMSP is the guiding document for how the natural resources will be restored and managed in the County park system. The vision, principles, and goals developed for and presented in the NRMSP provide the foundation and the intellectual thought map to put the natural resources within the parks on a trajectory toward a desired future condition: that of diverse, resilient, and sustainable ecosystems.

Dakota County Parks Visitor Services Plan

Another service provision of the Parks Department is providing educational and recreational opportunities for park visitors. The Dakota County Parks Visitor Services Plan (VSP), adopted in October 2017, provides some tacit support for reintroducing bison, from a park visitor's point of view.

Parks Visitor Services Plan Goals: The following major goals emerged from this process:

- Encourage and support healthy people and healthy communities
- Inspire greater environmental awareness and understanding [emphasis added]
- Provide services and opportunities that are relevant and accessible to more people
- Make the best use of investments in the park system
- Provide services in cost effective, responsive manner (p.i)

The Vision for Visitor Services:

Dakota County Parks Visitor Services offer affordable and relevant services that enrich the park experience, draw new visitors, and promote good stewardship of parks natural and financial resources (p. iv).

Guiding Principles for this Plan



The Visitor Services Plan was prepared in tandem with the County's Natural Resources Management Plan for the parks system and conservation easements. These planning projects informed each other as they developed, with attention to striking a healthy balance in preserving park natural resources while encouraging public use [presented in part]. (p.5)

- **2. Build Nature Appreciation**: Nature-based parks and visitor services build appreciation of natural resource systems through discovery, learning, and recreation in natural settings.
- **3. Seek Multiple Benefits of Stewardship**: Natural resource management provides cleaner air and water, biological diversity, native species habitat, improved visitor experience, community attractiveness, and public appreciation for natural resources.
- **4. Build Synergy**: Nature-based parks can and should build synergy between visitor services and resource management through events, education, volunteerism, marketing, and thoughtful design.
- **5. Engage the Public**: Natural resource management on County land should recognize public values and preferences, and provide opportunities for public engagement on resource management, education, and volunteerism.
- **6. Serve Communities**: Parks can strengthen communities and serve more current and potential park users by offering appealing and compatible visitor services, such as events, education, and volunteerism.
- **7. Use Multiple Approaches**: Parks can provide high quality visitor services by employing improved business practices, diverse funding sources, coordination with other providers, partnerships, and innovative approaches.
- **8. Become Known**: A clear system identity and contemporary marketing approaches are essential to building familiarity with and interest in parks. (p.5)

Community Interests and Needs. Community engagement is a central part of planning the future of visitor services. A variety of engagement methods were used in the development of this plan including surveys, workshops, and dialogue groups. A comprehensive description and analysis of those community engagement methods can be found in Chapter VI. Major themes that surfaced regarding community interest and needs include: (presented in part) (p.11)

- Adding new or novel services, facilities, and amenities that help visitors connect
 with nature are desired [emphasis added]. Suggestions included events appropriate
 for the setting, new forms of recreational equipment rental, and gathering areas to
 accommodate passive group activities.
- Expanding and creating new educational programs are favored by many community members, especially those that are current users of the park system



[emphasis added]. Partnerships were frequently suggested to expand the reach of programs to schools and other community organizations. (p. 11)

Opportunities by Service Area.

Awareness, Outreach, and Customer Service (p.14)

- Enhancing public awareness of parks emerged as a common theme [emphasis added]. Especially for under-represented populations, the lack of awareness is perhaps the most significant barrier to visiting a Dakota County park as well as a major factor in creating a welcoming park.
- Multi-lingual and culturally-aware services are necessary to serve an increasingly diverse community.
- Improvements to the park facility reservation process and policies related to timing may be needed.
- According to the anecdotal web survey, improvements are needed to the reservation and booking process for campgrounds and facilities. (p.14)

Outdoor Education

- The public has a strong expectation for outdoor education opportunities from Dakota County Parks [emphasis added]. City park providers mentioned in stakeholder interviews that County Parks are better suited for outdoor education than their systems.
- Surveys demonstrate strong public expectations for outdoor education opportunities from Dakota County Parks [emphasis added]. (p.14)

Awareness and Outreach Outcomes:

Awareness and outreach efforts will result in an anticipated 5% increase in park visitation, or 50,000 visitors, over five years with over 6,000 new park users to the park. (p.18)

Education Outcomes:

Outdoor education programming will reach more people and new audiences while expanding throughout the park system providing opportunities to further health and wellness as well as connections to the natural world. (p.20)

Summary. The Visitor Services Plan highlights the desire to provide greater environmental awareness, discovery, and understanding for park visitors and to increase the number of people visiting the County parks. A bison herd would be a unique educational asset that can help tell the story of the County's historic natural communities, ecological concepts, and the rich Native American culture that has been in this area for thousands of years. Bison were an important component of the environment and human culture. If the introduction of bison herds in both Minnesota State Parks and the Belwin Conservancy are examples by which to predict how a bison herd would impact visitor numbers, the County Park that has a bison herd would experience a relatively large increase in people visiting to view, experience, and learn about the bison.



Conclusion. The principles and goals for the County park system as presented in the Dakota County NRMSP and the VSP demonstrate support for reintroducing bison to a park in the County's park system for the ecological and visitor services benefits that they could provide.

If the scientific literature and existing parks planning documents support the concept of reintroducing bison for the ecological and cultural benefits that they would provide, it would be informative to explore the experiences of similar agencies that have implemented bison projects. The next section will present information about other agencies that have established bison herds.

Benchmarking

Utilizing grazing generally and bison specifically in prairie/savanna restoration and management is not a new concept or approach. There are several agencies in the Midwest that currently have bison and experience working with this animal that can serve as examples for Dakota County. This benchmarking exercise highlights seven organizations that have bison. These agencies have established a bison herd primarily for conservation reasons and not solely as an animal exhibit. That is not to say visitors cannot or do not have the ability to view and learn about them but that is not the primary reason why the herds were established. To evaluate the applicability of each agency's bison herd to Dakota County's situation, many factors were examined. Particularly, general information about the site's infrastructure (e.g., range size and configuration, fencing, gates, handling facility), herd information and management, and visitor services related to bison were evaluated. The agencies/sites surveyed include the following:

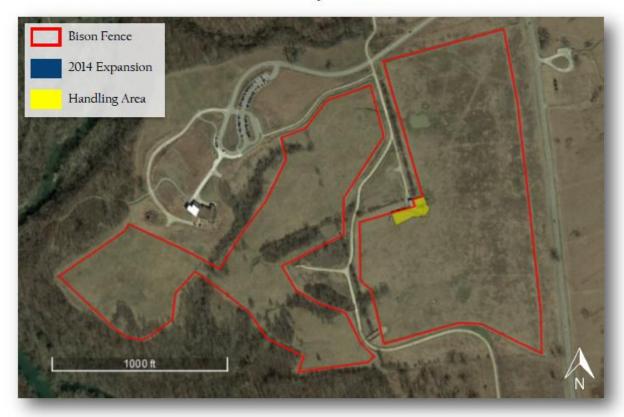
- Battelle Darby Creek, Galloway, Ohio
- Cedar Creek Ecosystem Science Reserve, East Bethel, Minnesota
- Neal Smith Wildlife Refuge, Prairie City, Iowa
- Belwin Conservancy, Afton, Minnesota
- Minneopa State Park, Mankato, Minnesota
- Jester Park, Granger, Iowa
- Sandhill Wildlife Area, Babcock, Wisconsin

The first section presented below contains basic attributes of each of these organizations' bison herd in a diagrammatic format. This format was chosen to provide a clearer picture of the site and the herd it contains. The second section provides more detailed information on how these agencies address pertinent issues such as seasonal versus year-round herd, supplemental water and feed, public and staff safety, outreach and education, infrastructure, partnerships, and monitoring.



Battelle Darby Creek

Galloway, Ohio



Enclosure Acres	55
Year Established	2011
Initial Herd Size	6
Current Herd Size	12
Male:Female Ratio	1:10
Ecosystem Type	Warm season and cool season prairie

FIGURE 1. BATTELLE DARBY CREEK

Summary

The bison at Battelle Darby Creek
Park graze on warm-season and cool
-season pasture throughout the year.
With the help of the Columbus Zoo,
males are periodically introduced to
ensure genetically diverse offspring.
A nature center and public greenway
near the enclosure allow the public
to safely view the bison. Monthly
educational programs have continuously been well attended



Battelle Darby Creek



Infrastructure

- 1) Bison Fence
- 2) Handling Area
- 3) Greenway
- 4) Greenway Gates

Bison Fence

Length: 2.4 miles
The bison enclosure consists of woven wire and wooden posts, with a
hot wire above and below. A wooden
fence adds an added buffer along the
greenway bisecting the two prairies.



Handling Area

Battelle Darby has a close partnership with The Wilds (i.e. the Columbus Zoo). The Wilds helps to rotate bison in and out of the herd, which maintains a target size of ~12 bison. Veterinary care, when needed, is provided by Ohio State.



Figure 2. Battelle Darby Creek



Battelle Darby Creek



Infrastructure

- 1) Bison Fence
- 2) Handling Area
- 3) Greenway
- 4) Greenway Gates

Greenway

The Darby Creek Greenway bisects the east and west pastures of the bison enclosure. This allows visitors to be as close as 10 feet from the fence. Subsequently, the USDA requires the park to maintain a Class C Exhibitor license.



Greenway Gates

A series of double gates and wooden fence allows park staff to move the bison safely between pastures and across the greenway. The herd is moved in the winter and fall, as well as several times throughout the summer.



Figure 3. Battelle Darby Creek



Cedar Creek Ecosystem Science Reserve

East Bethel, Minnesota



Enclosure Acres	210
Year Established	2018
Initial Herd Size	32
Current Herd Size	17
Male:Female Ratio	All male
Ecosystem Type	Oak Savanna

Figure 4. Cedar Creek Ecosystem Science Reserve

Summary

Cedar Creek's herd is provided annually by NorthStar Bison, and graze the oak savannas during the summer months. Researchers speculate bison grazing will enhance oak regeneration in the savanna ecosystem by reducing fuel load and competition. CCESR also provides bison related programming to the public, which reached over 1,500 people in 2018.



Cedar Creek Ecosystem Science Reserve



Infrastructure

- 1) Bison Fence
- 2) Double Gates
- 3) Supplemental Water
- 4) Observation Platform

Bison Fence

Length: 2.7 miles
The perimeter fence was constructed in 2017 by outside contractors. It consists of 48" woven wire attached to 3" steel posts. There is a 12" opening at the bottom to allow for wildlife to pass through.



Double Gates

There are two gates at each entrance along the northern boundary of the enclosure. Gates are closed and locked at all times while bison are present, and remain open in the offseason.



Figure 5. Cedar Creek Ecosystem Science Reserve



Cedar Creek Ecosystem Science Reserve



Infrastructure

- 1) Bison Fence
- 2) Double Gates
- 3) Supplemental Water
- 4) Observation Platform

Supplemental Water

CCESR has designated two areas with a total of three 300-gallon troughs. The pumps at each well are powered by a solar panel or portable generator. Troughs are secured on each side with wooden and metal posts.



Observation Platform

The gazebo, which is located along Fish Lake Trail, is open to the public several days each month. During these times, naturalists are on hand to provide information. The structure itself was constructed by a local scout troop.

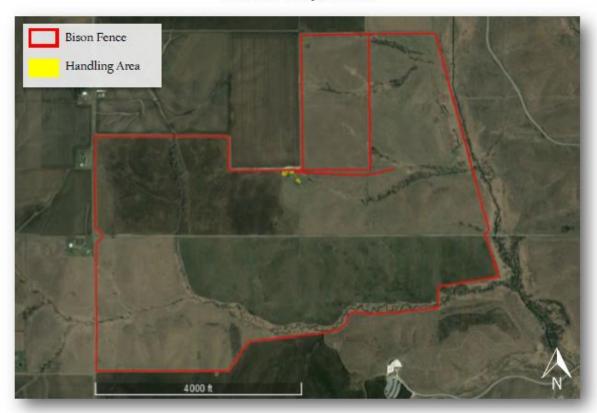


FIGURE 6. CEDAR CREEK ECOSYSTEM SCIENCE RESERVE



Neal Smith Wildlife Refuge

Prairie City, Iowa



Enclosure Acres	800
Year Established	1992-1996
Initial Herd Size	30
Current Herd Size	50 - 70
Male:Female Ratio	1:1
Ecosystem Type	Tallgrass prairie and streams

FIGURE 7. NEAL SMITH WILDLIFE REFUGE

Summary

The Neal Smith bison and elk herds are located on restored tallgrass prairie. The bison herd is also part of the national FWS genetics program. A management regime of patch burn grazing in the enclosure stimulates native vegetation, and reduces residual litter and non-natives. Visitors can enter the enclosure (in their vehicles) along an auto tour route that bisects east-west.



Neal Smith Wildlife Refuge



Infrastructure

- 1) Bison Fence
- 2) Auto Tour
- 3) Handling Area

Bison Fence

Length: 6 miles
The fence consists of 8-foot tall woven wire with wooden posts. The refuge proposed doubling the size of the
enclosure, which would effectively
double the size of the herd. This expansion has yet to be implemented.





Auto Tour

A 5 mile auto tour encircles the southern portion of bison and elk enclosure. Visitors are required to stay in their vehicle and on the road. Cattle guards are located at each of the two entrances to allow the gates to remain open during hours.



FIGURE 8. NEAL SMITH WILDLIFE REFUGE



Neal Smith Wildlife Refuge



Infrastructure

- 1) Bison Fence
- 2) Auto Tour
- 3) Handling Area

Handling Area

The bison are corralled once a year to obtain DNA samples, administer microchips, and reduce herd size. Bison are donated to tribal herds and conservation organizations to develop a sustainable population. Genetic testing of the herd prevents inbreeding.





FIGURE 9. NEAL SMITH WILDLIFE REFUGE



Belwin Conservancy

Afton, Minnesota



Enclosure Acres	170
Year Established	2008
Initial Herd Size	25
Current Herd Size	40
Male:Female Ratio	All juvenile males
Ecosystem Type	Tallgrass prairie

FIGURE 10. BELWIN CONSERVANCY

Summary

Similar to Cedar Creek, Belwin Conservancy has a close partnership with Northstar bison out of Rice Lake, Wisconsin. For over a decade, Belwin has received an annual herd of juvenile male bison, with marked improvement to prairie quality. The public makes thousands of visits to their observation platforms each year. The bison release in the spring draws in ~700 people.



Belwin Conservancy



Infrastructure

- 1) Bison Fence
- 2) Observation Platforms

Bison Fence

Length: 2.2 miles
The bison enclosure is made of woven wire fencing. The posts are evenly space and consist of about 3 metal
t-post for every wooden post. Reinforced fencing is used around the observation platforms.



Observation Platforms

A 20 foot platform and 6 foot accessible deck are open each day from dawn to dusk. Also, every year the conservancy hosts the Belwin Bison Festival, which includes the annual release of bison coming from Northstar.



FIGURE 11. BELWIN CONSERVANCY



Minneopa State Park

Mankato, Minnesota



Enclosure Acres	335
Year Established	2015
Initial Herd Size	11
Current Herd Size	30
Male:Female Ratio	1 Mature male
Ecosystem Type	Tallgrass Prairie

FIGURE 12. MINNEOPA STATE PARK

Summary

Minneopa State Park has been growing their bison herd over the past few years, with a goal of 30-40 individuals. Only one mature male will reside in the pasture at a time, and be rotated every several years to ensure genetic diversity. The bison are part of the growing Minnesota Conservation Herd, which consists of 130 genetically pure bison across several locations.



Minneopa State Park



Infrastructure

- 1) Bison Fence
- 2) Cattle Guards

Bison Fence

Length: 4.5 miles
The fence is built of 6 strand wire,
metal posts, and t-posts. The park is
also in the process of designing and
constructing a humane handling facility.



Cattle Guards

Cattle guards provide access to visitors along the internal auto route. People are required to remain in their vehicles along the 1.8 mile stretch of road. The park has noted very few issues between bison and visitors inside the enclosure.



FIGURE 43. MINNEOPA STATE PARK



Jester Park

Granger, Iowa



Enclosure Acres	19
Year Established	1968
Initial Herd Size	10
Current Herd Size	10 (plus 10 elk)
Male:Female Ratio	2:8 (1 juvenile M and 1 mature M)
Ecosystem Type	Prairie

FIGURE 14. JESTER PARK

Summary

The grazing herd at Jester Park consist of 10 bison and 10 elk. Originally, the herd grazed the total 19 acres year-round. However, managers switched to a high density, low duration rotational grazing. This is accomplished with three separate pastures and low burn frequency. Due to the size and proximity of the visitors to the enclosure, the park maintains a Class C exhibitors license.



Jester Park



Infrastructure

- 1) Bison Fence
- 2) Handling Area
- Observation Area and Natural Playscape

Bison Fence

Length: 1.2 miles
The bison fence is constructed of 8'
woven wire and wooden posts. An
internal electric fence was added after an incident with a park visitor ~10
years ago. There have been no issues
since.



Handling Area

This area is used to separate animals from the herd or to administer veterinary care. The park utilizes a local vet, or the local zoo if tranquilization is needed. Culled bison are donated to the local food pantry or auctioned off.



FIGURE 15. JESTER PARK



Jester Park



Infrastructure

- 1) Bison Fence
- 2) Handling Area
- Observation Area and Natural Playscape

Observation Area and Natural Playscape

Since bison and elk at Jester Park are also an exhibition herd, strong emphasis is place on viewing and educational opportunities. Nature center staff provide programs and events throughout the year.





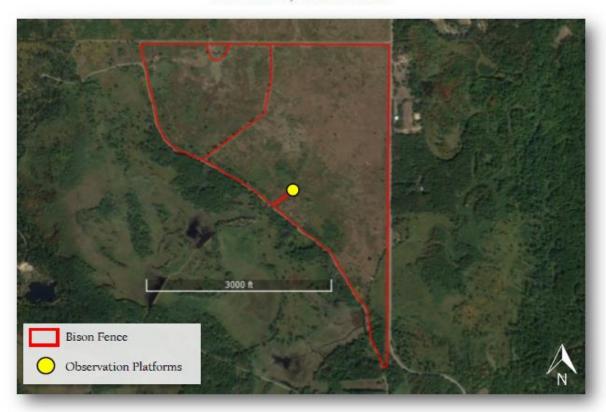


FIGURE 16. JESTER PARK



Sandhill Wildlife Area

Babcock, Wisconsin



Enclosure Acres	255
Year Established	1962
Initial Herd Size	12
Current Herd Size	15
Male:Female Ratio	1 breeding male
Ecosystem Type	Oak Savanna

FIGURE 17. SANDHILL WILDLIFE AREA

Summary

When Wisconsin DNR purchased the Sandhill Wildlife Area in 1962, the former owner donated his herd of 12 bison. Currently, the herd helps maintain oak savanna habitat, and periodically receives a new mating bull. DNR staff has focused some of its restoration efforts on promoting wild lupine and karner blue butterflies in the oak savanna pasture.



Sandhill Wildlife Area



Infrastructure

- 1) Bison Fence
- 2) Observation Platform

Bison Fence

Length: 3.7 miles
The entire property is surrounded by
16 miles of 10 foot tall, deer-proof
fencing. This more robust fence constitutes the eastern boundary of the
bison enclosure, while the internal
fence is shorter woven wire.



Observation Platform

An observation tower located along a the 14-mile Trumpeter Trail auto route affords views of the bison savanna. Viewing the bison is cited as one of the primary reasons people visit the property.



FIGURE 18. SANDHILL WILDLIFE AREA



Seasonal Herd Versus Year-round Herd

Seasonal Herd. The duration that bison graze throughout the year dictates infrastructure requirements, herd demographics, and organizational partnerships. For instance, Cedar Creek Ecosystem Science Reserve (CCESR) and Belwin Conservancy each receive an all-male herd annually from Northstar, which remains on the prairie/savanna from June to September. The brevity of the bison's stay eliminates the need for a handling/sorting area, onsite routine veterinary care, or genetic testing.

Although a seasonal herd may reduce staff and infrastructure expenses, the needs of the herd must be met throughout the season that they are onsite. This includes, but is not limited to, supplemental water facilities and daily checks for apparent health concerns and the integrity of the infrastructure. Depending on the organization that loans the bison, some management restrictions may be required. For example, Northstar has requested that CCESR not use any chemicals in the enclosure that may be harmful to bison.

The seasonal approach for introducing bison for prairie/savanna restoration is not very common. However, it has proven to be a successful management strategy for Belwin, which continues a decadelong partnership with Northstar. CCESR, which has received seasonal bison for two years, stated this approach made sense in terms of current staffing and expenses. They also mentioned its utility as a way to transition to a full-time herd.

Year-round Herd. Developing a year-round herd—whereby bison are initially introduced to the prairie at lower numbers and are slowly grown annually to meet restoration goals—is more common among conservation agencies than the seasonal herd approach. A year-round herd introduces the need to manage demographics and genetic diversity. Since the herd is essentially an isolated metapopulation, park staff must consider annual demographics of the dynamic herd, such as age class and sex ratios. At lower population levels (e.g., 10–40 bison), the herd could consist of mostly females plus one juvenile male and one mature male. When the mature male's offspring reach maturity, he is removed from the herd to prevent inbreeding.

Maintaining herd demographics, as well as animal health, requires a humane handling facility within the bison enclosure. This infrastructure allows staff to administer microchips, take blood and hair samples, and monitor health. The information gathered during these round-ups can be used to ensure genetic diversity across multiple herds, in partnership with organizations like the Minnesota Bison Conservation Herd or the North America Bison Genetics Project of the Wildlife Conservation Society. The handling facility also aides in the culling process by concentrating the herd. Bison removed from the enclosure can have several fates, such as being auctioned off or donated to a tribe/conservation agency.



Food and Water

Water. Based on estimates by Penn State University, a herd of 32 bison may require up to 500 gallons of water a day in the summer. Consequentially, access to a constant water supply is important to the health of the herd. Adequate water supply in fenced-in prairies can be achieved through several types of water sources, which can be natural, human-made, or a combination of the two. Examples of natural water sources include the wetland complexes at Cedar Creek and the riparian zones at Neal Smith. Unlike cattle, bison tend not to loaf around wetlands; this reduces the risk of soil erosion or compaction in ecologically sensitive areas.

However, staff at Minneopa State Park have had different experiences. As natural water sources have developed within the park's bison range, due to excessive rainfall, bison have gravitated to new, seasonal wetlands as opposed to existing wetlands and, at times, have spent hours loafing around these water sources or even just standing in the water.

Even if naturally occurring water is seemingly abundant, most agencies have constructed supplemental sources for dry conditions and for winter conditions. This frequently involves a well, pump, and trough system. Powering well pumps in remote pastures may require gas generators or solar panels. Constructed wetlands offer another human-made alternative. Minneopa State Park recently used this method within their pasture to create an ecologically viable wetland, which is lined with packed bentonite clay. During winter, bison naturally eat snow or use their hooves to break through ice, but heated troughs can provide an additional source of open water.

Food and Minerals. Supplemental winter feeding can occur on a weekly basis for smaller herds or as needed for larger herds. Battelle Darby Creek provides one bale of hay per week in the winter months but believes that it may not be fully necessary. Jester Park also provides hay as well as one gallon of cracked corn and baby bovine feed supplement every day in the brunt of winter, which tapers down to once a week in the summer. Regular feeding by the park manager develops an interaction routine that can also facilitate health checks.

Some of the larger herds (on over 700 acres) tend not to receive extra feed in winter. Neal Smith Refuge establishes herd sizes below standard carrying capacity to meet their adaptive management goals. This leaves enough forage on the prairie year-round to sustain both bison and prairie health. Without winter supplement, the bison lose weight in the winter (as they naturally would) and gain it back in the spring and summer. Similarly, the Crane Trust does not provide supplemental winter feed, except during harsh winter conditions such as ice storms.

Regardless of supplemental feeding regimens, each herd requires year-round access to mineral supplements. This can be as simple as an all-species mineral mix, which is continually replenished. Some herd managers are researching the option to supply different minerals at different times of the year—based on varying requirements throughout a bison's lifecycle. During round-ups, mineral blocks can be placed in the corral to increase the bison's comfort level to close-quarters interactions with staff.



Public and Staff Safety

Herd managers use a variety of strategies to reduce the risk of dangerous encounters with bison. Here are some ways these agencies have operationalized risk management:

- Ensure that all bison needs are met within the enclosure. Provided with enough food, water, access to other members of the herd, and low stress, individuals have little motivation to escape. Stocking rates and pasture design should be adaptive and based on potential forage production of the prairie, while working in concert with restoration and outreach goals.
- Reduce the number of people allowed into the bison enclosure. This minimizes the chance of
 improperly locked gates. In parks with auto routes and cattle guards, proper education of
 visitors and staff is required. This includes reminders that bison are dangerous and
 unpredictable and may charge without warning.
- Check fences and other structures regularly, especially following strong weather events. Heavy
 rains and soil erosion can lead to downed fence lines or gaps along streams. Neal Smith Refuge
 noted one instance where heavy snow and ice filled the cattle guard and allowed the bison to
 escape.
- Develop a clear emergency response plan and list of contacts in the case of escaped bison. This
 can include specific scenarios and appropriate actions (e.g., escaped calf versus escaped bull).
 The risk of a bison collision along an adjacent highway is often stated as a major concern and
 should be addressed in the response plan.

Herd managers at benchmarking sites have reported few, if any, hazardous situations between bison and humans. Minneopa State Park, which allows visitors to drive through the enclosure, reported few problems with visitors exiting their vehicles in the enclosure. Likewise, Battelle Darby Creek has not encountered any issues with greenway users who come in close proximity to their bison fence. They attribute their clean safety record to clear guidelines and reminders to visitors that bison should be treated with the same level of respect as any other wild animal. A negative interaction between a bison and visitor occurred at Jester Park roughly 10 years ago and was addressed with an additional electric fence. No issues have been reported since.

Beyond interactions with visitors, clear protocols and training for staff should be developed, especially for entering the enclosure, corralling, and handling the bison. Jennifer L. Lanier and Dr. Temple Grandin of CSU outline safe handling techniques in their primer *The Calming of American Bison (Bison bison)*During Routine Handling. They emphasize the importance of designing infrastructure and protocols based on an understanding of bison behavior.



Outreach and Education

Education. Most educational programming about bison centers on providing opportunities to see the bison on the prairie. The most common approach organizations have used to facilitate this is by way of a dedicated viewing area, such as a gazebo, platform, or tower. When feasible, trails afford views along fence lines or from higher vantage points.

Some organizations have taken this one step further and allow visitors into the enclosures under strict guidelines. Visitors to Neal Smith and Minneopa State Park can drive their personal vehicles along a single route through the enclosure, provided they stay in their vehicles. Belwin Conservancy has built a "bison buggy", which allows the public to join a naturalist on a tour of the bison pasture. They were motivated by ad hoc excursions in their utility vehicle where "everybody that [they] took out ... fell in love with the experience of being deep in the prairie and surrounded by bison."

Combining educational programming with these viewing opportunities tells a compelling story of bison and their role in the prairie/savanna. For example, Battelle Darby Creek includes bison-related programs each month, which have been continuously well-attended. They also reported a jump in attendance after reintroducing bison—even before building a visitor center. An example of another approach is Cedar Creek's viewing gazebo, which is staffed by naturalists several times a month during the summer and open to the public. Many organizations employ a range of public engagement tools. For example, the City of Fort Collins states that "educational programming, volunteer service learning, and original research opportunities will continue to be offered to provide residents with an open window into the lives of bison."

Public Input. Reintroducing bison to a public space requires public buy-in and support, as well as opportunity for comments. Cedar Creek provides a noteworthy example of bringing community members into the fold during planning and implementation. Prior to reintroducing bison, the Science Reserve hosted three public meetings, which were advertised to the neighbors of the property. The meetings consisted of a short presentation by staff including a summary of their plan and research interests, followed by a longer question-and-answer session. Northstar Bison staff also fielded questions.

Several key insights came out of these meetings. Overall, the plan to reintroduce bison was well-received by those in attendance. The most common concern was bison escaping the enclosure. This was addressed with an overview of the infrastructure, bison behavior, management plan, and safety protocol. Cedar Creek also designed the informational meetings to build on people's enthusiasm about bison, which further enhanced their support.

Infrastructure

Fencing. A wide range of fence types can be used to enclose bison—with options as varied as electric, woven, and single-strand wire. However, no barrier is standard across agencies. The choice should be informed by site characteristics like soils and wetlands, as well as management strategies such as



rotational grazing. Managers might consider the impact of various fences on the movement of other wildlife. Visitor services and public interaction can also influence this decision. For example, using single strand over woven wire may lead to differing perceptions of safety by visitors.

Due to the growing number of herds in North America, several technical guides to bison fencing have been developed for natural resource practitioners and ranchers. The University of Calgary developed the guide *Fencing Guidelines for Bison on Alberta Public Lands*, which illustrates key considerations and options. The NRCS offers specific examples of improving fencing for wildlife in their guide *How to Build Fence with Wildlife in Mind*.

Regardless of fence design, the infrastructure should work in concert with the needs of the bison. Tim Fraiser (personal communication) from Bison LLC notes that bison containment involves more than just fencing: "Food, family, water and the fact that they are a wild and native animal are among the top considerations," he states. Cormack Gates of the University of Calgary echoes this sentiment: "The risk of bison straying is significantly reduced with good range management and husbandry practices. It is harder to hold bison in over-utilized pastures: Hungry bison push fences. Bison will not normally challenge adequate fences if the range is healthy and water is available."

Handling Facilities. In addition, year-round herds will require handling infrastructure. When designed well, the bison handling area will facilitate humane practices and minimize stressful situations—for staff and animals. Like fence design, the layout of the handling facility considers bison behavior, such as a motivation for food/minerals and a fear of isolation from the herd.

While these systems can become increasingly complex (such as adding pre-sorting pens and load-outs), it is important to plan for current and future needs. Several ranch equipment outfitters provide an overview of facility design and the factors that influence these decisions (e.g., Hi-Hog and Frasier Bison LLC). Some factors include size of the herd, length of time in each pen, and size of the processing team. In addition, the University of Nebraska Medical Center and Colorado State University have developed guides that outline safe handling techniques.

Partnerships

Partnerships are often cited as a crucial part of ensuring successful reintroduction and continued management of public bison herds. For example, the City of Fort Collins states that "it took a unique set of partners with complementary resources and missions to ultimately make bison reintroduction a success." Prior to their 2015 reintroduction, an Intergovernmental Agreement solidified future collaboration among city, county, academic, and federal agencies.

The most salient example of an ongoing partnership surrounding bison reintroduction is the Minnesota Conservation Herd project. In 2016, the Minnesota Department of Natural Resources (DNR) and Minnesota Zoological Garden (MZG) formed this partnership around a clear set of goals and steps for managing American bison in the state. The underlying objective of these founding partners is to "manage and interpret bison as a natural resource, as part of the prairie ecosystem" and "contribute to the overall conservation of American Plains bison." Based on empirically derived recommendations, the



Minnesota Conservation Herd will consist of about 500 bison across multiple sites. In their Strategic Plan for Bison Management, DNR and MZG state they are "open to partnering with other organizations in Minnesota as part of the Minnesota Bison Conservation Herd effort."

Monitoring

Dakota County currently utilizes a diverse set of monitoring protocols to measure changes within their prairies, for both wildlife and vegetation. This approach informs current and future management decisions and would also be required to successfully implement a bison reintroduction plan. An underlying goal of reuniting bison with native prairie is achieving greater biodiversity. To this end, a tailored monitoring protocol should measure biodiversity metrics before, during, and after grazing.

There are many methodologies for monitoring prairie vegetation, including transects and releves which are currently utilized by Dakota County. Another option was recently developed by the Prairie Reconstructive Initiative, which applies nested plots and a meandering walk, allowing managers to understand how species richness and composition change over time. Changes in prairie plant composition will also impact wildlife habitat, which requires clear monitoring objectives to understand these impacts. Based on limitations involving staff time and monitoring season length, monitoring efforts can focus on broad groups, such as odonates (dragonflies), or individual species, such as the regal fritillary butterfly.

Enterprise Risk Management

Introduction

A critical component in the bison reintroduction decision-making process is risk. County Staff, led by the Dakota County Office of Risk Management, conducted an Enterprise Risk Management (ERM) Process to identify potential positive and negative risks associated with reintroducing bison to a County park. The ERM was utilized to:

- Identify key risks of the project
- Identify Subject Matter Experts (SMEs) and Stakeholders to participate
- Provide introduction to ERM concepts and tools for managing risk
- Utilize SMEs to identify
 - Risks
 - Risk triggers and sources
 - Potential Consequences
 - Risk Treatments
- Provide Risk Management infrastructure to support risk assessment
- Develop the ability of SMEs to apply risk treatment to project risks/opportunities

A group of internal and external stakeholders and content experts participated in two ERM workshops early in 2019. The workshops were designed to identify the risk categories, specific risks/opportunities, potential consequences, risk treatments, and the likelihood, potential consequences, and total risk



ranking score for specific risks/opportunities. The goal of the ERM was not to determine whether the bison reintroduction should or should not take place but rather to identify the negative risks and ways to reduce them and conversely to identify the positive risks/opportunities and ways to maximize those.

Results

The ERM process identified 31 potential individual risks or opportunities within four risk categories associated with reintroducing bison. The risk categories highlighted were the following: i) Public, ii) Park Facilities, iii) Staff, and iv) Bison. Each risk/opportunity received a score for the likelihood of occurrence (L), the severity of the consequences (C) if it did occur, and a total risk ranking score (T). In addition, treatments were identified to minimize the risks and maximize the opportunities. The maximum score for likelihood of occurrence was five. The maximum score for consequence was five. The total risk ranking score was calculated by multiplying the likelihood score by the consequence score. The maximum total risk ranking score that an identified risk could receive was 25. The following risks/opportunities were those that received a total risk ranking score of 12 or more. They were identified as the most important risk factors associated with a bison reintroduction project within the County park system.

The potential consequences, if the identified risks do occur, can be very significant. These consequences include personal injury or even death to County staff and/or park visitors. Dakota County is self-insured for all tort liability claims within the context and intent of Minnesota Statute §466. For example, if a bison escaped and caused personal injury or a death, Dakota County is subject to maximum liabilities per person and for each claim as defined in Minnesota Statute §466.04. The statute provides that the maximum limits are \$500,000 per person and \$1,500,000 for each claim arising out of single occurrence. In other cases, the infrastructure required to have a bison herd could disrupt or change how visitors can experience the park. Some trails may need to be abandoned or relocated. The following table provides the specific risk information from the ERM.



Risk Category	Risks/Opportunities	Potential Consequences	Risk Treatments	L	С	T
Public	Interactions with bison	Personal injuries or	· Electric fence to keep bison away from outer fence	5	5	25
		death	· Fencing of bison range (inspection protocols)			
			· Warning signage			
			· Programming and Education (web and print)			
			· Use of bison ambassadors			
· Trail separation		· Radio – low power am/fm "bison radio"				
			· Trail separation	1		
			· Observation platforms – safe picture areas			
			· Tours for controlled observation – bison buggy rides			
Park	Inability to use	Interactions	· Trail design	5	5	25
Facilities	current trail systems	with bison SLP	· Consideration for bison location			
Staff	,		· Training	4	5	20
interaction bison	interactions with bison	injuries or death	· Interactions-trained staff only. Restrict others.			
			· Cabbed vehicles			
			· ATVs in corral to funnel			
			· Use of rattle paddle and flagged poles	1		
			Ways to shut gates with sticks and ropes to stay out of bison occupied areas			
			Design facilities for no staff required in space occupied by bison (Adequate capital funding)			
			· Limit confined spaces			
			· Assign appropriate personal protective equipment to staff (shoes, glasses, gloves, etc.)			
			· No horseback wrangling of bison			
Staff	Direct staff interactions with bison	Personal injuries or death	See above		5	15
Public	Interactions with	Pet injuries or	· Warning signage	4	3	12
	domestic animals		· Programming and Education			
			· Use of bison ambassadors	1		
			· Radio – low power am/fm "bison radio"	1		
			More staff during high traffic periods			
			· Enforcement of leash ordinance	1		

Table 1. Risks and Treatments Identified During ERM



Summary

The ERM process identified potential risks and opportunities associated with reintroducing bison. The risk information generated during the ERM process can be used in several ways, with the goal of reducing the negative risks as much as possible. If directed by the County Board to proceed with reintroducing bison to a park within the County's system, this ERM information will be used to help inform the design of all the infrastructure required to safely control and manage the animals and park visitors. In addition, this information can be used to generate operational best management practices related to managing the animals and reducing risk to the park visitors. Codified in safety, training, management, and escape procedure manuals, the risk treatments identified during the ERM essentially become a checklist of safety elements to be incorporated into the planning, implementation, and operational phases of a bison reintroduction and management project.

The most significant risks that were identified during the ERM process were the public's interaction with the bison, impacts to visitors' ability to utilize areas or aspects of the park, and the staff interaction with the bison. As presented in the above table, there are treatments that can be implemented to minimize these risks. For example, the treatments that can be incorporated into the range design and public viewing plan to reduce the risks to park visitors would include, but are not limited to, establishing appropriate herd size based on the carrying capacity of the range to reduce the bison's need or desire to challenge the fence and incorporating a second or safety fence in areas where pedestrians could be in close proximity to the bison. This would include areas along roads and trails that would provide an effective degree of separation between visitors and the bison, appropriate warning signs, frequent perimeter fence inspections, educational programming, and controlled public viewing areas.

Project Requirements

The requirements of a bison reintroduction project can be grouped into three categories:

- Bison
- Containment/safety
- Visitor services

Bison

This category contains those elements that the bison would need to stay healthy and safe. These include obtaining the bison themselves and providing nutrition and water while considering their social structure and medical care.

Bison. There are at least two options for obtaining bison. As presented in the benchmarking section, one option that both the Belwin Conservancy and the Cedar Creek Ecosystem Science Reserve (CCESR) utilize is to contract with a private company to provide bison. In the case of these two organizations, both contract with Northstar Bison (based in Cameron, WI) to provide bison. In this model, the



landowner provides the infrastructure needed to contain the bison and provide nutrition and water. The entity which owns the bison delivers the animals to the location in the spring and then picks them up in late summer. The bison are on site for four to five months during the growing season. The owner of the bison provides for any care that is required during the time that they are at the summer range. In the case of Northstar, no monetary exchange takes place with CCESR or Belwin Conservancy. Northstar is provided summer grazing ranges to grow their bison and the landowner enjoys the ecological, visitor service, and research benefits obtained by hosting the grazing bison for the four or five months that they are on range.

On September 12, 2019, Tom Lewanski had a phone conversation with Marielle Hewitt of Northstar Bison, LLC. She indicated that her company would be interested in exploring a partnership that is similar to the ones that the company has with Belwin Conservancy and CCESR, if the County Board directs staff to proceed with a bison project.

Another model for acquiring bison would be to partner with the Minnesota Bison Conservation Herd Partnership (MBCHP). In this case, MBCHP would provide Dakota County with bison that have been culled from the conservation herd. If this model was followed, the bison would be owned and maintained by Dakota County. While the MBCHP has offered the bison and assistance with some aspects of the herd management, the responsibility for the herd would be Dakota County's. Unlike the previous model, the bison obtained through the MBCHP would be onsite all year. As a result, the infrastructure required to manage a "full-time" herd would necessarily be more extensive. This will be presented in more detail in the containment/safety section.

During several discussions with DNR staff, it was indicated that Dakota County, as a partner in the MBCHP, might be able to receive bison culled from the State's conservation herd. Preliminary discussions have indicated that if the County Board of Commissioners directs staff to proceed with the reintroduction project, the County would be able to obtain bison at no direct cost.

Are there more benefits that would be accrued by pursuing one bison acquisition model vs. the other? From an ecological perspective, the longer that the bison are on range the greater the benefit to the prairie within the range. There would then be more of an ecological benefit by obtaining the bison from the MBCHP and having the animals on range throughout the year. If a private entity, in the "rental" model, drops off the bison in June and picks them up in September, like the other organizations in Minnesota that utilize these private bison, they would be on range for four months of the growing season. A permanent herd would be on range 2-3 additional months of the growing season, depending on the length of the growing season that year. Even during the winter months, the bison continue to feed and so are affecting vegetation as they scrape snow away from the ground and push over and through woody vegetation. Bison dung is also deposited throughout the year, enriching the soil. They also disperse seeds throughout the winter.

There are several additional benefits that would be realized by partnering with the MBCHP. In addition to receiving the bison, the experience and expertise that the partners have gained over the years



through managing the State's conservation herd would be available to train County staff and assist with some aspects of the management of the County's herd. There is some indication that State funding sources (Legislative-Citizen Commission on Minnesota Resources and Lessard-Sams Outdoor Heritage Council) would look favorably upon a funding proposal if the County was in partnership with the MBCH and was cooperating with its statewide goals. The MBCHP submitted a letter indicating their interest in Dakota County joining the partnership. A copy is included in the Appendices. Dakota County would be taking action to advocate for and contribute to perpetuation of a rare species.

From a visitor service perspective, the bison, obtained through the MBCHP, would be available to view and learn about twelve months of the year, vs. the four months that bison would be on site if they were provided by a private entity. Bison interact with their environment in different ways throughout the year. Seeing bison pushing snow out of the way with their large heads and necks helps to inform visitors about their ecology and their physical makeup. Watching calves come into the world and interact with the prairie and herd would attract many people. These experiences would not be possible if a private herd were utilized. A permanent herd would make this animal a part of the park, like the birds, insects and the other mammals. It would help to define what Spring Lake Park Reserve is.

Another consideration is the public perception of and sensitivity to a private herd, which in full disclosure, would be raised for meat. All or some of the bison that would be "rented" for a season would be picked up and butchered at the end of the summer.

Taking Care of the Bison's Needs. The health, safety, and contentment of bison hinge on providing for their needs, which are relatively simple. Providing for their needs will help keep the herd and individual animals healthy. Doing this will also help to keep them safe, because if the bison have all their needs met within the structured range, they are less likely to attempt to leave the range. Leaving the range will expose the animals to situations that can harm them, cause them to be killed, or put people at risk.

Nutrition. The most important element of a healthy, contained bison herd is proper nutrition.

Bison are classified as a grazing ruminant and exhibit a degree of forage selection... If allowed the opportunity, bison will consume feeds that will meet, if not exceed, daily protein and energy requirements. Therefore, pasture quality and quantity, forage variety and availability are extremely important for grazing bison. (Feist 2000)

During the growing season, bison are essentially self-sufficient (MNDNR 2012). Occasional feeding of grain can assist in herd control and increase their comfort using the corral. In other words, bison derive most of their dietary requirements from the plants—or, more specifically, the grasses—growing within their range.

The stocking rate for the herd location in Dakota County would be calculated to minimize or eliminate the need for supplemental feeding during the times when snow covers the ground. However, based on regular health reviews, some supplemental feeding may be required or advised. The winter months will



be approached with a cache of native prairie hay, ideally harvested from a County park. Prairie hay will be utilized to both mimic the bison's normal diet and to reduce the risk of introducing weed species into the range.

Blue Mounds State Park maintains a herd of approximately 100 bison. The park staff provides three bales of prairie hay per week during the four winter months for a total of 50 bales. It is anticipated that the County's herd will be about 30 animals, or roughly 30 percent of the Blue Mounds herd. For planning purposes and using a similar supplemental feeding rate as Blue Mounds, Dakota County could provide one bale of hay per week for a total of 15–16 bales required for the winter season. The County could contract with a local farmer to cut the required hay from a prairie within a park. Haying a different location each year would simultaneously provide supplemental food for a bison herd while also providing some of the benefits of grazing to prairie areas not appropriate for a bison herd. Dakota County staff will determine the carrying capacity of the selected site by conducting a forage analysis, which will provide the data needed to determine the herd size.

A best management practice is to provide supplemental salt and minerals for the herd. Providing salt and mineral blocks helps ensure that their diet contains the proper amount of salt and trace minerals required for good health. Grain, such as corn, could be used for two purposes. Small amounts are used to, first, train bison to use the corral more frequently as the roundup approaches and, second, to supplement hay feeding during the winter months. However, grain use is probably more of an animal control technique than a means to provide nutrition.

Water must be available year-round for the animals. Depending on the reintroduction project site, wells may need to be installed or plumbing extensions from current well locations may need to be built to provide water. While bison do obtain some water from snow, heated water tanks will need to be installed to provide necessary water during the winter months. The number and location of water tanks will be based on the bison range configuration and field conditions at the reintroduction project site.

Containment/Safety

Perimeter fence. Successfully containing bison is crucial for the safety of the bison, park visitors, and County staff. Containment is basically achieved by fencing that runs the entire range perimeter. As presented in the benchmarking section of this document, there is no one system that is used across agencies that have bison. Dakota County staff are recommending that, if directed by the County Board to proceed, fencing used by Minneopa State Park in Mankato Minnesota serve as the model for the County's fencing (see appendices for the Minneopa State Park's fencing specifics). The MN DNR staff's experience with bison led them to this design; it seems to be very effective, and it provides movement for other animals that will share the area with the bison. There is no interest in designing a fencing system that otherwise limits the movement of area wildlife in the landscape.

The fencing design that is being recommended is made up of five-strand high-tensile wire, with approximately 12 inches between strands for a total fence height of six feet. This fencing will run the



perimeter of the bison range. In addition, there will be a second fence (of similar design as the perimeter fence) inside the perimeter fence at certain locations where people, not contained in a vehicle, could come into contact with the bison by sticking a hand or leg inside of the perimeter fence (see specific park maps for suggested locations of safety fences).

Staff need to be able to access the bison range to monitor the herd, fence, water sources, and other bison-related infrastructure as well as conduct natural resource management activities. As a result, gates will need to be installed at various locations along the perimeter fence to facilitate access to the range. These gates will serve a secondary purpose as well. Due to the behavioral characteristics of herding animals, if a bison were to find itself outside of the perimeter fence, it will only be interested in rejoining its herd. These gates also serve as an entrance back into the range and back with the herd for the escapee.

If a park is chosen that would allow/necessitate a road for public use to go through the range, cattle guards would allow vehicle use of the road while preventing bison from leaving the range. These cattle guards would allow people to travel within the bison range, providing the up-close views of the animals while staying safe within their vehicles.

Handling Facility. The type of handling facility that would be required would be based on the structure of the bison ownership. If the County Board directs staff to proceed with a bison reintroduction project and to pursue an agreement to "rent" bison from a third party, a very limited handling facility would be required. This would likely be in the form of a corral, which is essentially a relatively small, fenced-in area that would facilitate the transfer of the bison onto and off of trucks/trailers as they are introduced to or removed from the park's range.

In the second scenario in which the County owned the bison and they were present year-round, the handling facility would necessarily need to be more extensive. A handling facility is used to concentrate the bison to facilitate an annual roundup and possibly a second time in order to cull the herd. The purpose of the roundup is to conduct a health assessment for each animal and to cull the herd, if required. During the roundup, the animals are first gathered into a catch pen, which should be big enough to allow the herd to feel comfortable and not crowded. They are generally coaxed into the catch pen using grain or corn, which is provided to the bison over the course of several weeks to acclimate them to the catch pen. From the catch pen the animals are moved into the cutting pen or crowding alley. The idea is to get the herd down to a line of single animals that ultimately are individually contained within the squeeze where the health assessment and testing is conducted. After the assessment, the animal enters the load out which will provide options for the ultimate destination of the animal. This could be in a sorting pen, if it is going to be culled, or back out into the larger range. This is an oversimplification of the facility and is presented to merely convey information about its purpose and use.



Health

There are several diseases that bison can contract including brucellosis and malignant catarrhal fever. Brucellosis is a nonnative, bacterial disease that induces abortions in pregnant cattle, elk, and bison, which could adversely affect the bison population. This should not be a great concern because the proposed SLPR bison range is 1.37 miles from the nearest known cattle operation. Site one at MRPR is 2 miles from the nearest known cattle operation and site two is 1.4 miles from the nearest known cattle operation, so the chances of bison or cattle encountering infected birth tissue are extremely remote. While MN herds are not known to have the disease, the bison would be vaccinated against it. Malignant catarrhal fever is a viral disease that is often fatal to bison. This disease is carried by sheep and goats, which are resistant to the virus. There are no known sheep farms near MRPR or SLPR. Goats could not be utilized in the part of the park which contains the bison.

Visitor Services

During 2019, County staff visited four bison herds to gather information for this study. Representatives from each of the organizations, upon whose lands the bison were present, stated that if a bison herd is established, the public is going to want to view them. This fact is in line with goals established in the Visitor Services Plan. This bison reintroduction project is being proposed for the ecological benefits that they can provide for the natural areas in the County's parks. However, park visitors can also benefit from the project by having the ability to view and learn about bison ecology, their role in the environment, and the County's efforts to improve the ecological health of the parks. Visitor service amenities have two aspects to consider. First, there are the existing facilities that currently serve park visitors that pose a challenge to developing a bison range at that park. Restored prairie at these sites may be bifurcated by trails or roads, making the development of a single, connected bison range within that park difficult. This issue will be discussed for each of the three parks in the Site Analysis section. The second aspect of this concerns the infrastructure required to serve those people who will travel to the park to view the bison. The infrastructure components would include an entrance road, parking, drinking water, possibly restrooms, picnicking facilities, benches, and some sort of structure that park visitors can use to view the bison. These could include a raised viewing platform and/or a trail. The specific mode of bison watching will depend on the site chosen to develop the bison range and therefore the actual structure(s) required. Some site-specific ideas are included in the Site Analysis section.

Site Analysis

Having provided the foundational information regarding the ecological benefits, existing organizational underpinnings for a bison reintroduction project, other agency models, and the requirements for hosting a bison herd, the focus can shift to analyzing the individual County parks to gain an understanding which, if any, meet the habitat requirements of the bison.



Dakota County contains three regional parks: Lebanon Hills Regional Park, Whitetail Woods Regional Park, and Lake Byllesby Regional Park. The County also contains two park reserves, Spring Lake Park Reserve and Miesville Park Reserve, and a County park, Thompson County Park. Of these six parks, three of them can be eliminated from consideration to host a bison herd because they do not contain the minimum habitat requirements of the animal. The parks eliminated from consideration are Lebanon Hills Regional Park, Lake Byllesby Regional Park, and Thompson County Park. In addition, Whitetail Woods is not being considered for hosting a bison herd. Staff have determined that to design and provide a suitable range for bison, a significant portion of the park would be unavailable for visitors to use. The relatively small size of this park and the current and planned visitor services presented in the adopted Master Plan preclude the addition of a viable bison range.

This section will present information about the suitability of the two remaining Parks, Spring Lake Park Reserve, and Miesville Ravine Park Reserve for a bison herd. Each can be considered because they contain the minimum habitat requirements for the bison. In other words, they each contain enough prairie and savanna to meet the nutritional needs of a bison herd. However, there are numerous other factors that need to be considered, including water, visitor services, and existing infrastructure. Each of these parks has numerous advantages and challenges as they relate to bison and visitor service requirements. These issues need to be carefully considered if the decision is made to implement a bison reintroduction project. The maps presented for each of the parks are in concept form and represent the possible extent of a bison range and not necessarily the final range that would be developed if that park is chosen. Staff from the Minnesota Department of Natural Resources assisted in the site analysis process. County and DNR staff conducted site visits to each of the two parks listed above. The DNR staff's perspectives have been incorporated into the following descriptions.

All maps included demonstrate potential and approximate bison ranges. Actual range configurations would require field investigation and decisions regarding acceptable visitor services disruption and needs.

Spring Lake Park Reserve (SLPR). A 150-acre bison range can be developed in the western portion of the park. This bison range represents roughly 13 percent of the park. Two bison range concepts for this park are provided here.

SLPR bison range concept one. In this concept (figure 19), the range is one large unit and the bison have access to it in its entirety in their timeframe and interest. Staff are not needed to move the bison within the range. However, to provide this size of range, the existing Mississippi River Greenway trail would need to be moved slightly to the north.

- One hundred and fifty acres of restored prairie will be enhanced by having the bison reintroduced to the park.
- Important infrastructure components are in place, including access roads and well(s) (but not watering structures) to provide water for bison as well as parking and restrooms for visitors interested in viewing the bison.



- There would be several ways for visitors to view the bison: Approximately one mile of a
 reconfigured Mississippi River Greenway trail would be adjacent to the bison range, providing
 excellent views of the animals; visitors would have the ability to drive through the bison range
 for a short distance near the archery range entrance; and people utilizing the retreat center
 could have great views of the bison.
- The local road access provides opportunities for Park Patrol to monitor for vandalism.
- The land where this park was established has a rich human history, dating back thousands of years of Native American habitation and use, in part due to its proximity to the Mississippi River. Area tribes also had a rich and important relationship with bison in the area. Reintroducing bison can add an interesting and informative resource as interpretive opportunities invite park visitors to learn about Native American history in the area.
- The park is also close to several population centers (Hastings, Rosemount, Inver Grove Heights, Eagan).

There are also challenges that would need to be considered and/or overcome if this concept is implemented at this park.

- Approximately .75 mile of the Mississippi River Greenway trail would need to be rerouted at a cost of approximately \$577,000.
- A soft surfaced trail would need to be rerouted or abandoned.
- There is the potential of bison viewers stopping along Pine Bend Trail causing traffic issues, although this road is not currently a heavily used road.
- The relatively remote location exposes a risk of vandalism.
- Both concepts have the entrance road to the Camp Spring Lake and the archery range going through the bison range. This would provide a safe way for people arriving in cars to view the bison while going on to their destination within the park. This would preclude visitors arriving on foot or bike. Staff do feel that the regional trail when completed, at the far western boundary of the park, would provide a safe entrance point to the park for these visitors as it will be outside of the bison range.
- There is the potential of bison viewers overwhelming visitor-centered infrastructure (parking, restrooms).



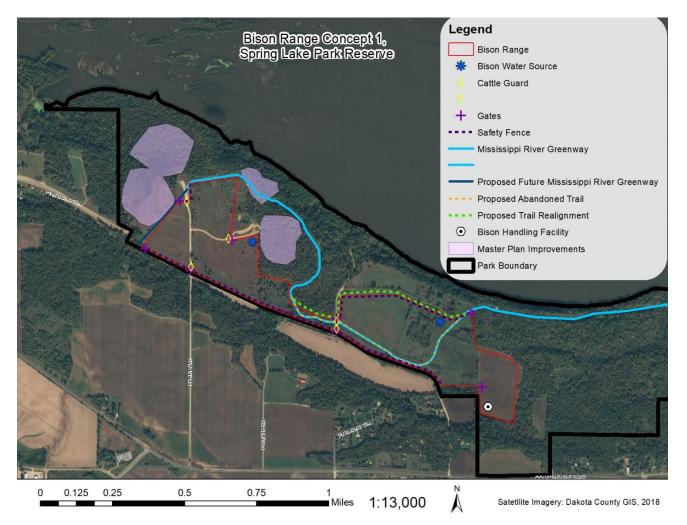


FIGURE 19. PROPOSED SLPR BISON RANGE - CONCEPT ONE

SLPR bison range concept two. In this concept (Figure 20) the range is divided into three paddocks. Staff would be required to move the animals between paddocks as informed by habitat conditions. This concept would allow the regional trail to be left where it is currently located.

- One hundred and forty-one acres of restored prairie will be enhanced by having the bison reintroduced to the park.
- Important infrastructure components are in place, including access roads and well(s) (but not watering structures) to provide water for bison as well as parking and restrooms for visitors interested in viewing the bison.
- There would be several ways for visitors to view the bison: Approximately one mile of the Mississippi River Greenway trail would be adjacent to the bison range, providing excellent views of the animals; visitors would have the ability to drive through the bison range for a short



- distance near the archery range entrance; and people utilizing the retreat center could have great views of the bison.
- The local road access provides opportunities for Park Patrol to monitor for vandalism and for NR staff to access the range for monitoring purposes.
- The land where this park was established has a rich human history, dating back thousands of years of Native American habitation and use, in part due to its proximity to the Mississippi River. Area tribes also had a rich and important relationship with bison in the area. Reintroducing bison can add an interesting and informative resource as interpretive opportunities invite park visitors to learn about Native American history in the area.
- The park is also close to several population centers (Hastings, Rosemount, Inver Grove Heights, Eagan).

There are also challenges that would need to be considered and/or overcome if this concept is implemented at this park.

- A soft surfaced trail would need to be rerouted or abandoned.
- There is the potential of bison viewers stopping along Pine Bend Trail causing traffic issues, although this road is not currently a heavily used road.
- The relatively remote location exposes a risk of vandalism.
- Both concepts have the entrance road to the Camp Spring Lake and the archery range going through the bison range. This would provide a safe way for people arriving in cars to view the bison while going on to their destination within the park. This would preclude visitors arriving on foot or bike. Staff do feel that the regional trail when completed, at the far western boundary of the park, would provide a safe entrance point to the park for these visitors as it will be outside of the bison range.
- There is the potential of bison viewers overwhelming visitor-centered infrastructure (parking, restrooms).
- The bison would not have access to the entire range at one time. The animals and habitat would need to be closely monitored to ensure that the carrying capacity of the paddock was maintained. The animals would need to be moved from one paddock to another, requiring more interaction between staff and bison. The possibility of an escape would increase when the bison are being moved from one paddock to another. The Mississippi River Greenway trail would need to be closed on a temporary basis while the bison were being moved from paddock to paddock.



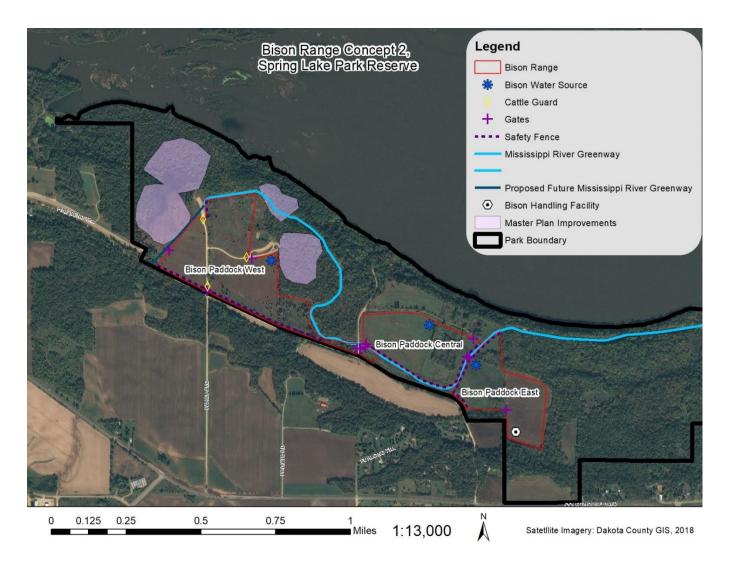


FIGURE 20. PROPOSED SLPR BISON RANGE - CONCEPT TWO

Master Plan review. The bison range as depicted in both conceptual models would be compatible with the adopted Master Plan. The plan does illustrate several visitor service provisions in the vicinity of the conceptual bison range. These include an archery range, the Village, lodge, and group camp. However, these visitor amenities would be outside of the bison range as depicted in both concepts. The proximity of the bison to these visitor service provisions can be viewed as adding another amenity for park visitors. The Master Plan does show trails within the conceptual bison ranges, but staff feel that trails can be provided in the vicinity that would allow park visitors to view the bison. A Master Plan update for SLPR was initiated in 2019 and will be brought to the County Board in 2020 for adoption. If the County Board directs staff to proceed with a bison project within this park, the new Master Plan will consider and plan for the bison herd.



Miesville Ravine Park Reserve (MRPR)

There are two possible locations for a bison herd within this park.

Site One. Approximately 230-acre bison range that could support 30-35 bison (Figure 21). The Site One bison range as presented on the accompanying map would occupy 15% of the park. There are numerous advantages for establishing the bison herd at this site in this park:

- 230-acres of restored prairie would be enhanced by having the bison re-introduced to the park.
 This provides the greatest ecological benefits of all the potential bison ranges in the three parks.
- No existing visitor service provisions or infrastructure would need to be altered or moved to accommodate a bison range.
- With no access to the site, the risk of vandalism is not as great as other possible project locations.
- As presented, the range provides a secluded site for the location of a corral and handling facility away from public viewing.
- If it is a goal to increase visitation to this park, a bison herd could help attract visitors.

There are also challenges that would need to be considered and/or overcome if the draft bison range would be established at this site in this park:

- All required bison-related infrastructure would need be developed (e.g., access road, well(s)).
- No visitor services currently exist (e.g., no public access road, trails, restrooms, parking, or available water).
- This potential bison range is 1.4 miles long and rolling in character. There are few landscape vantage points where visitors can view the entire or even much of the range.
- It is not close to population centers.
- It is not close to staff offices, making the required frequent and regular monitoring visits more time consuming.

Site Two. This approximately 100-acre site could support 10-20 bison (Figure 21). The site two bison range as presented on the accompanying map would make six percent of the park inaccessible to visitors. There are numerous advantages for establishing the bison herd at this site in this park:

- One hundred acres of restored prairie will be enhanced by having the bison reintroduced to the park.
- No existing visitor service provisions or infrastructure would need to be altered or moved to accommodate a bison range.
- There would be easy access from 280th for monitoring and management purposes.

In addition to the challenges presented for Site One, Site Two also faces the following challenges:



- It would be a relatively small bison range.
- There would be the potential for people to stop and park along 280th Street East, causing traffic issues at this location. This could also be an irritation to the people living along 280th Street East.
- There is no existing natural water feature or well to provide water for bison. A well would need to be drilled.
- 280th Street East along the southern boundary of the range, coupled with the remoteness of the location, exposes a risk to vandalism.
- As presented, the range does not provide a secluded site for the location of a corral and handling facility away from public viewing.

Master Plan review. The bison ranges as depicted as site one and site two would be compatible with the adopted Master Plan. The only visitor service amenity presented in the plan that would be within site one is the ridgeline trail, which could still be developed in conjunction with a bison herd. The Master Plan depicts no visitor service amenities in or near site two.



Draft MRPR bison ranges

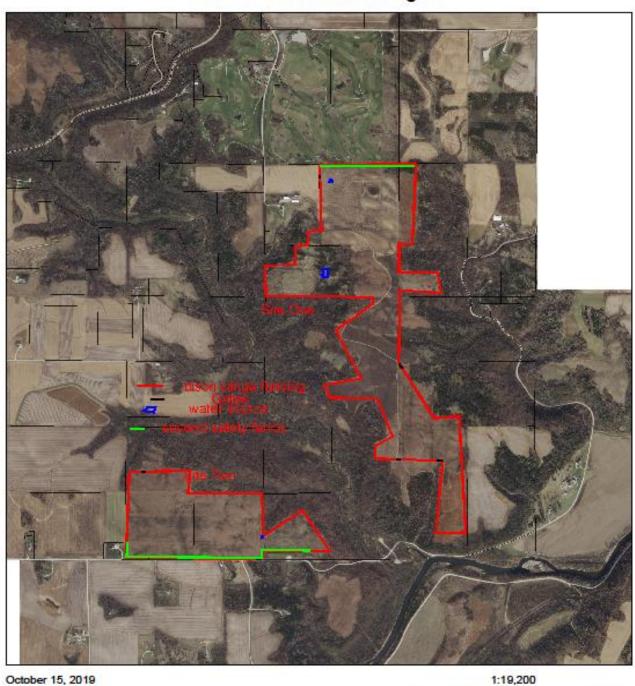


Figure 21. Draft MPRP bison range sites



Discussion

The Dakota County park system has two parks that meet the minimum requirements for hosting a bison herd. That is, they each contain enough acres of prairie/savanna to meet the dietary needs of a herd. In addition, these two parks have current adopted Master Plans that are compatible with a bison reintroduction project. However, there are numerous other considerations and components that need to be considered when making the decision regarding which park is the best fit. The components can be divided into to three groups: bison management, ecological benefit, and visitor services.

As far as managing the bison and providing a healthy and safe place for the herd to exist, each park has both pros and cons. Each of the two parks contains adequate forage (grass) for a small herd of bison (approximately 30 animals). A forage analysis will need to be done to determine the exact size of the herd that each site can maintain. Essential minerals can be provided via general mineral blocks placed at each site.

Water availability varies for each of these parks. For both range concepts at SLPR, no natural surface water features exist, so water would need to be provided. Given the size of the proposed range (1.3 miles in length) within concept one, a minimum of two water sources would need to be provided. In this case, wells already exist, which could be tapped into to provide water for the bison. On the eastern side of the range, a well associated with a former private home was capped but not sealed and could be made operational to provide water at this location (see Figures 19, 20) for approximate location of the eastern water provision site). On the western end of the range, wells exist to service the restrooms near the archery range and at the Camp Spring Lake Retreat Center. Either of these could be utilized to provide water for the bison. Each of these water sources can incorporate heating elements to ensure the water is available throughout the year. For concept two, which divides the entire range into three paddocks, three separate water sources would need to be provided, one for each paddock. The existing wells, discussed for concept one, are also available as water sources for concept two. If no power line is close, solar panels could be used to provide power.

Within MRPR, the eastern bison range (Site One on Figure 21) does contain one .22-acre wetland (PUBGh-Palustrine unconsolidated bottom permanently flooded diked/impounded, PEM1-Freshwater Emergent Wetland habitat) which might be able to serve as a water source for a bison herd (see blue polygon on MRPR map, (figure 21). Because of its size (approximately 1.4 miles in length), this range would need a second, heated water source which would require a new well. Site two within this park does not contain a natural water source. Because of its size, one water source would suffice which would have to be provided by a new well. If no power line is close, solar panels could be used to provide power.

If Dakota County implements a bison reintroduction project, an animal control system will need to be built to gather the bison either to transport the herd off-site, if the bison are on a rental basis and owned by another entity, or to conduct a yearly roundup and possibly to cull the herd, if the animals are owned by the County. In the first instance, a corral will suffice to concentrate the animals to facilitate moving them onto trucks/trailers. In the second scenario in which Dakota County would own the bison,



both a corral and handling facility would be required. In both cases, the ideal location would be away from public view. This would be for the benefit of both the animals and the public.

SLPR has an ideal location for these animal handling facilities. It can be located at the far east corner of the range and currently has an access road to it. Both concepts can utilize this site for a handling facility. With no public amenities or access, MRPR has several locations where these facilities could be built. If this park is chosen for a bison project and these handling facilities are established, future visitor service amenities could be planned and located away from them.

Costs

Capital. All the infrastructure components required by the bison can be provided at each of the proposed sites. An important decision factor is the cost of providing these components at each of these sites. The following table presents approximate costs for the following project components for each park based on the draft site ranges presented. Actual costs will necessarily be based on final range size and configuration.

												Total bison
											Total bison	related
											related	infrastructure
											infrastructure	without
					Handling						w/ handling	handling
					facility						facility	facility
	Bison	Bison	Total		including					Greenway	(includes 25%	(includes 25%
	fence -	fence -	perimeter		squeeze		Cattle guard	Water	Storage	realignment	inflation and	inflation and
	primary	safety	fencing	corral	shoot	Gates	for roads	provision	building	expense	contingency)	contingency)
Site												
SLPR - Concept												
One	\$36,216	\$18,612	\$ 54,828	\$5,000	\$ 400,000	\$5,850	\$ 39,000	\$ 19,100	\$14,000	\$ 577,000	\$ 1,393,472	\$ 893,472
SLPR - Concept												
Two	\$40,543	\$13,214	\$ 53,757	\$5,000	\$ 400,000	\$7,150	\$ 23,400	\$ 33,300	\$14,000		\$ 670,607	\$ 170,607
MRPR - Site one	\$46,800	\$ 3,330	\$ 50,130	\$5,000	\$ 400,000	\$2,600	\$ -	\$ 28,500	\$14,000		\$ 625,230	\$ 125,230
MRPR - Site two	\$20,520	\$ 7,200	\$ 27,720	\$5,000	\$ 400,000	\$1,950	\$ -	\$ 20,400	\$14,000		\$ 586,070	\$ 86,070

Table 2. Estimated bison infrastructure costs per park

Notes: Expenses associated with visitor services can only be determined after a site is chosen and an actual range is designed, and the level of service provision is determined. The specific services will be determined during the design phase, if directed to proceed by the County Board. A minimum of an observation deck and interpretive signage would cost in the range of \$100,000 - \$150,000. These can be designed and built during the initial implementation phase or serve as a future phase of the project. To establish the SLPR concept one range, approximately .75 miles of the regional trail would need to be moved slightly north of its current location (Figure 19). The cost for building this amount of trail is estimated to be approximately \$577,000. This plan does not call for dismantling the existing trail, and therefore there would not be additional costs to remove it.

Funding Sources for Capital Expenses. There are two legislative bodies that could provide funding for a bison project. The Legislative-Citizen Commission on Minnesota Resources (LCCMR) provides funding recommendations to the legislature for environment and natural resource projects. These funds come primarily from the Environment and Natural Resources Trust Fund (ENRTF). The University of Minnesota



received a three-year ENRTF grant in 2017, for a project entitled Restoring and Preserving Savanna Using Bison. In addition, the MN DNR received an ENRTF grant, in 2015, for a project entitled Reintroduction and Interpretation of Bison in Minnesota State Parks. The LCCMR 2020–2021 funding timeline has not been set as of the date that this document was completed, however draft proposals to LCCMR will likely be due in March of 2020, with final proposals due in April.

The second legislative body is the Lessard-Sams Outdoor Heritage Council (LSOHC) which recommends projects for funding from the Outdoor Heritage Fund that "directly relate to the restoration, protection, and enhancement of wetlands, prairies, forests, and habitat for fish, game, and wildlife, and that prevent forest fragmentation, encourage forest consolidation, and expand restored native prairie." The Minnesota Sharp-tailed Grouse Society and Pheasants Forever received a 2019 Outdoor Heritage Grant, and The Nature Conservancy received a 2019 Outdoor Heritage Grant; both projects contained conservation grazing as a funded activity. The LSOHC 2020–2021 funding timeline has not been set as of the date that this document was completed. Draft proposals to the Council will likely be due in May of 2020.

Operating expenses.

Staffing. It is anticipated a .5 FTE will be needed to manage herd-related activities. The position would pose an annual expense of approximately \$47,312 (e.g., for salary, benefits, computer, phone stipend). The duties of the wildlife technician would be:

- Check on the health of the bison; account for each animal's whereabouts and general health
- Check the water supply (ensure operation, clean, and disinfect water tanks)
- Check perimeter, safety, and holding facility fences
- Repair fencing as required
- Additional trail maintenance, restroom cleaning and monitoring of visitor activities associated with increased numbers of visitors
- Provide grain feeding
- Procure hay and feed bison (if required during winter)
- Maintain buffer outside of perimeter fence (mowing and tree and shrub removal)
- Inspect and prepare feeding equipment
- Organize annual round up
- Inspect and maintain holding facility
- Develop and maintain stud book and animal data book
- Organize annual health assessment and vet care as needed
- Inspect all gates and ensure proper operation
- Inspect all cattle guards and ensure proper operation (if present)
- Record keeping and reporting
- Organize staff/researcher's safety training and proper range behavior
- Assist with natural resource management/monitoring within bison range
- Assist with research projects within bison range



Equipment supplies and services. Once established, a bison herd is relatively self-sufficient and minimal inputs are required. Approximate annual expenses are calculated at \$7,250:

• Design and engineering: 7-10% of capital expenses

Consultant – Project administration inspection: 7-10% of capital expenses*

• Electricity for heated water source and shed: \$800

Salt and mineral blocks: \$350Diatomaceous earth: \$600

Grain: \$2,500

• Veterinarian costs (as needed): \$1,500

• Prairie hay: \$700

Fence repair supplies: \$500Handling facility repair: \$300

Total annual operating expenses would come to \$54,562. (with the addition of onetime expenses for project design, engineering, administration and inspection)

Potential Funding Sources for Operating Expenses.

- Parks and Trails Legacy Fund
- Metropolitan Council Operations and Maintenance
- Environmental Legacy Fund (ELF)
- Fee based revenue
- Dakota County levy

Ecological benefits

After examining each park's ability to meet the needs of the animals and the associated costs, the next area of analysis is the ecological benefit potential for each park from the reintroduction of bison. While this is difficult to predict, there are at least two perspectives on this. There is some evidence that targeted dispersal of species across habitat boundaries from areas of high to low biodiversity, or spillover, can be enhanced by bison/grazing. This grazing provides disturbances within the restored prairie that seeds from adjacent high-diversity prairie remnants can be introduced (Sperry et al. 2019), increasing the plant diversity on the restored prairie within the bison range. Therefore, it follows that parks that contain diverse remnants have the potential to benefit more from bison than those that do not. Using this model, the park that could gain the most would be MRPR, because there are relatively large (compared to the other potential sites) remnant prairies near the proposed Site One bison range. Spring Lake Park Reserve could also benefit, to a lesser extent, from spillover. There is a prairie remnant about .4 miles to the east and high-diversity prairies less than two miles to the west.

As stated earlier in this document, any prairie will be enhanced by returning grazing generally and bison specifically to the park. Since all the proposed bison ranges in each of the two parks are situated on



^{*} The nature of this project is such that internal expertise could provide these services.

restored prairie, the relative ecological benefit should be similar across the parks, the above discussion notwithstanding. Assuming this is true, assigning relative ecological benefit is a matter of the number of acres being grazed by the bison. Using this simple methodology, Site One at MRPR (230 acres) would accrue the most benefits followed by SLPR (150 acres), with Site Two at MRPR (100 acres) accruing the least benefit. Utilizing both methods for assigning potential ecological benefit results in the same conclusion. Miesville Ravine Park Reserve would benefit ecologically the most from a bison herd, followed by SLPR. It should be noted that this in terms of relativity to each other, as all sites would benefit from the grazing and other bison behaviors.

Visitor Services

The final area of analysis required in the site selection process is visitor services. Bison reintroduction impacts on visitor services can be grouped into two areas: impacts on current visitor services and services required to accommodate people coming to the park to experience the bison. During information gathering trips to area bison herds, it was frequently pointed out that if Dakota County establishes a bison herd, people are going to want to view them. As an example, at Minneopa State Park, 2014 (pre-bison) attendance numbers were at 173,000. In 2015, when bison were introduced into the park, attendance numbers grew to 233,000, and the numbers have increased each year since. The park has experienced a 69 percent increase in attendance since the bison were introduced into the park (personal communication, 1/2/2019).

The proposed bison ranges in the two County parks necessarily require relatively large areas of land to accommodate the habitat needs of the animal. Retrofitting the infrastructure needed to keep the bison and park visitors contained and safe can have profound impacts on existing visitor services. On the other hand, existing visitor service infrastructure can accommodate and serve those coming to the park to experience the bison. Spring Lake Park Reserve contains examples of both. As presented on the draft SLPR concept one bison range map, approximately .75 miles of the existing regional trail would need to be relocated slightly north of its present location to accommodate the bison range as proposed. The regional trail would not need to be moved if concept two is chosen, because the entire range is divided into three paddocks, leaving the trail in place and outside of the bison range.

In addition, roughly .9 miles of natural surfaced trail near the retreat center would need to be abandoned or relocated for both concepts. Conversely, there are several existing visitor improvements that would serve people visiting the park to experience the bison. The existing entrance road and parking lots at the archery range and retreat center could be available for people who are visiting specifically to see the bison. In addition, the existing restroom, water, and picnic shelter facilities are available for visitors. The existing regional trail provides opportunities for visitors to view the bison over large parts of the proposed range. It is possible that the existing visitor services infrastructure would be inadequate to meet the needs of the number of people interested in visiting the park to experience the bison.

There are no existing visitor service amenities associated with either Site One or Site Two bison ranges at MRPR. From that point of view, there would be no disruption to existing services or infrastructure.



However, if the County wanted to provide access for the public to experience the bison, if established at one of these sites, all appropriate services would need to be built. At Site One, a public access road would need to be provided as would a parking area and possibly restrooms, water, and picnicking (e.g., table, shelter) amenities for visitors. In addition, some accommodation(s) for viewing the bison would need to be established. These could include a trail, viewing platform, in-range automobile road. At Site Two at MRPR, similar visitor amenities would need to be provided except for an access road, because a parking lot could be established from 280th Street East. The actual improvements provided would be dependent on the level of service provision that the County wanted to provide at these sites. A concern at Site Two would be people stopping and/or parking along 280th Street East, causing traffic issues and possibly disturbing homeowners in the area.

Summary

The following comparison table summarizes the park suitability for bison using key project components.

	Park Suitability For Bison Table											
	Site attribute	quantity of adopte		Existing bison infrastructure (water [well, natural], electricity, access, etc.)	services (access, parking, restrooms, water, viewing	Near human population centers	Potential partnerships	Operational effectency				
Park												
Miesville Ravine Park Reserve		***	***	*			**	*				
Spring Lake Park Reserve		***	***	***	****	***	**	***				

Table 3. Park suitability comparison

There are four County parks that can be eliminated from consideration as presented above. If the County Board directs the staff to implement a bison reintroduction project, the second decision point focuses on where this reintroduction should take place. Of the two parks that meet the basic bison habitat requirements, MRPR presents the most challenges for several reasons. There is no infrastructure currently in the park that the bison would require. Additionally, there is no visitor services infrastructure currently in place. It is the most remote park and therefore the furthest from population centers and would have the greatest travel distance for County staff to conduct regular and frequent monitoring visits. While the park, specifically Site One, would have the most to gain from reintroducing bison, it would be the most expensive to implement if the project includes the infrastructure required to facilitate and welcome visitor viewing. If undertaken purely as a prairie enhancement/management project, with no visitor service provisions, it would likely be the least expensive alternative. From this analysis, the most viable option for a bison reintroduction project would be SLPR.

Spring Lake Park Reserve. This park could provide a bison range of approximately 150 contiguous acres, creating habitat for about 30 bison. A forage analysis would need to be conducted to determine the actual number. This park currently contains numerous access points to the proposed range that



would make monitoring of the herd and the infrastructure (fences, gates, cattle guards, and watering feature) efficient. The location of the park would make regular monitoring visits relatively convenient. Electricity and water sources are available for the bison-required infrastructure. The eastern section of the proposed range would provide an ideal location for the animal handling facility. It is secluded and has an access road to it. To accommodate visitors, there are an existing entrance road, restrooms, and parking lots (the archery range and Camp Spring Lake each contain space for 36 cars), and the regional trail would accommodate public visitation. Additional parking may be needed if the bison become a very popular attraction. County staff are currently updating both the Master Plan and the Natural Resource Management Plan for this park. If this park is chosen, these plans can reflect this project and future needs for visitor services, interpretation, and natural resource management associated with the bison herd.

If concept one is chosen, there are existing trails that would need to be moved. Approximately .75 miles of the existing regional trail would need to be relocated slightly north of its present location to accommodate the bison range as proposed. This concept provides the most habitat to the bison, unfettered by fences. Concept two, utilizing a paddock system would not require moving the regional trail, as the paddocks would be designed around the existing location of the trail. A paddock system, as presented in concept two, would require more bison/human interaction as County staff would need to facilitate the movement of bison from one paddock to another. Roughly .9 miles of natural surface trail, near Camp Spring Lake, would need to be abandoned or relocated if either concept is chosen.

Because of its location and the fact that soil would be disturbed for some of the required infrastructure, a cultural resource review would need to be conducted to determined potential impacts to archeological sites.

In the final analysis, SLPR would provide the best option to reintroduce a bison herd. The bison will improve 150 acres of restored prairie and Dakota County residents will have the opportunity to experience and learn about this iconic native animal and its role in the Native American culture of this area.

Next Steps

When this study is presented to the Dakota County Board of Commissioners, staff will be looking for direction on three bison project-related issues.

- 1. Should County Staff proceed with a bison reintroduction project?
- 2. Should Dakota County join the Minnesota Bison Conservation Herd partnership or contract with a private entity to procure bison?
- 3. Which park should be chosen for the bison reintroduction project?

Subject to County Board direction, there is a sequence of planning that would need to be completed.

- Staff will refine the design for the bison range and develop an updated capital cost estimate.
- Staff will design associated visitor service improvements including an associated cost estimate.



- Staff will develop an implementation plan, a bison owner's/operational manual, and a safety manual.
- Staff will contact the Minnesota Bison Conservation Herd Partnership to understand the associated partnership terms and responsibilities of the County.
- Staff will prepare and submit grant proposal(s) to the LCCMR and LSOHC.
- Staff will conduct a public engagement process to solicit project input.
- Staff will return to the Board at a future meeting with an update to the items above.

Public Engagement

An effort was made to seek public input on the idea of reintroducing bison in Dakota County. Two methods were employed to obtain this input. A story map was developed which included a general survey about the idea. In addition, public input was solicited during an open house, held on October 14, 2019, for the Spring Lake Park Reserve Master Plan and Natural Resource Management Plan development process.

Bison Story Map

The story map presents information on Dakota County's natural history and the role of bison in that history. At the end of the presentation, there is a link to a four-question survey along with a section for general feedback and comments. A link to the story map was provided on the Dakota County park's webpage and Facebook page. Information about the story map was also included in the October park's listsery. While this survey is not scientifically valid, it does provide some measure of public thought about the idea. The questions asked were:

- What do you think about the idea of reintroducing bison to a County Park?
- If bison are reintroduced into a park, how interested are you in being able to view them?
- If bison are reintroduced into a park, what would be your major concerns about it?
- If bison are reintroduced into a park, would you be interested in educational programs about bison?

As of November 1, 502 people participated in the story map survey. The results of the survey were as follows:

- What do you think about the idea of reintroducing bison to a County Park?
 - o I like the idea......90.04%

 - o I am unsure about the idea6.37%
- If bison are reintroduced into a park, how interested are you in being able to view them?
 - o I would definitely travel to the park to view the bison.........85.26%
 - o I would have no interest in viewing the bison......3.19%



0	I would	d view the	bison if	I was in th	e parl	k11.55%
---	---------	------------	----------	-------------	--------	---------

- If bison are reintroduced into a park, what would be your major concerns about it?
 - o Safety for the bison......52.79%
 - o Safety for park visitors......36.65%
 - o I have no concerns about reintroducing bison......28.29%
 - o Expense of reintroducing and maintaining bison.....24.70%
 - Losing accessibility to portions of the park......9.56%
- If bison are reintroduced into a park, would you be interested in educational programs about bison?
 - o I would be very interested in attending programs......51.79%
 - I would be mildly interested in attending programs......38.25%
 - o I would have no interest in attending programs......9.76%

There were 203 people who provided comments in the survey. Survey result charts are included in the Appendices along with all the comments that were received.

Table at Spring Lake Park Reserve Open House

On Monday October 14, 2019, an open house was conducted to provide information and solicit public input about the Master Plan and Natural Resource Management Plan that are in the process of being developed for Spring Lake Park Reserve. A table devoted to the bison reintroduction idea was staffed to gauge participants' feelings and thoughts about this idea. Numerous people stopped by the table to discuss the topic. A simple voting exercise was included. People were asked to place a bean in a container if they did not like the idea of reintroducing bison or place a bean in another container if the person liked the idea of reintroducing bison. By the end of the open house, 16 (94% of survey participants) people had placed a bean in the "I like the idea" container, and one (6% of survey participants) person had placed a bean in the "I do not like the idea" container.

While these surveys included a very small sample size and are not statistically valid, they do provide some measure of public thought about the idea. The bison story map can be viewed at: https://dakotacounty.maps.arcgis.com/apps/Cascade/index.html?appid=bef2827f6d4d46f994571112b3 e7d6d6

Technical Advisory Committee

A technical Advisory Committee was formed to provide guidance regarding reintroducing bison and to review this feasibility study. Their suggestions were incorporated into the final draft document. The Committee was made up of:



- Ed Quinn, Natural Resource Program Supervisor, MN Dept of Natural Resources, Division of Parks and Trails
- Craig Beckman, Minneopa State Park Manager, MN Dept of Natural Resources, Division of Parks and Trails
- Diana Weinhardt, Curator of Northern Trail, Minnesota Zoological Gardens

Note of Thanks: We would like to thank the Committee for providing guidance and wisdom during the development of this study. Their experience with *Bison bison* bison was invaluable as we thought about a bison project. Ed Quinn and Craig Beckman, of the Minnesota Department of Natural Resources also spent a day in the field with Dakota County natural resource staff to evaluate the three parks that were being considered for this project. We would also like to thank the project consultant, Sam Talbot, who researched and provided information used in the study.

Enterprise Risk Management Participants

- Scott Hagen, Dakota County
- Joseph Walton, Dakota County
- Steve Sullivan, Dakota County
- Taud Hoopingarner, Dakota County
- B.J. Battig, Dakota County
- Autumn Hubbell, Dakota County
- Brad Deitner, Dakota County
- Jenny Groskopf, Dakota County
- Tom Lewanski, Dakota County
- Ed Quinn, Minnesota Department of Natural Resources
- Craig Beckman, Minnesota Department of Natural Resources
- Bob Fashingbauer, Minnesota Department of Natural Resources
- Diana Weinhardt, Minnesota Zoological Gardens



List of Appendices

Appendix A Letter from the Minnesota Bison Conservation Herd Partnership





November 10, 2019

Tom Lewanski, DPA Natural Resources Manager Dakota County Parks 14955 Galaxie Avenue Apple Valley, MN 55124

Dear Tom,

We have been pleased to be part of Dakota County's efforts to assess the feasibility of re-introducing bison to a unit in your county park system. It is exciting to be able to share information on our experiences with your team and to visit some potential reintroduction sites in the Dakota County park system.

As you know, the MN Department of Natural Resources – Division of Parks & Trails (MNDNR) and the Minnesota Zoo (MZG) have a formal agreement to play a role in conserving the population and genetics of the American Plains Bison (Bison bison bison). Our agreement has two primary goals: 1) to manage a meta-population of bison free of detectable levels of cattle DNA introgression, and 2) that the herd is large enough to have a high level of genetic diversity and sustain that diversity over the long-term.

Currently, we have approximately 128 bison amongst three different locations: Blue Mounds State Park, Minneopa State Park, and the Minnesota Zoo. Research indicates that a larger population, around 400-500 animals is necessary to sustain genetic viability for the long term. While we are continuing to assess the potential for an additional state park location or two, we are also in need of additional partners to achieve the meta-population size necessary to retain genetic diversity.

To become a member of the Minnesota Bison Conservation Herd (MBCH), an organization must agree to manage its bison so that there is no detectable evidence of cattle nuclear or mitochondrial DNA in the herd. In doing so, that organization benefits by receiving "founder" animals from the MBCH and by being part of the meta-population so genetics data is tracked and animals are moved between herds as needed to retain and improve genetic diversity of the sub-populations and overall MBCH. There are some additional requirements for MBCH members, but this one is the most critical.

Should Dakota County decide to move ahead with a bison reintroduction to your park system, we hope you'll consider joining the MN Bison Conservation Herd and look forward to further discussions at that time.

Sincerely.

Ed Quinn

Natural Resource Program Supervisor

Elan M. avine

Minnesota Department of Natural Resources – Division of Parks and Trails

Kevin Willis

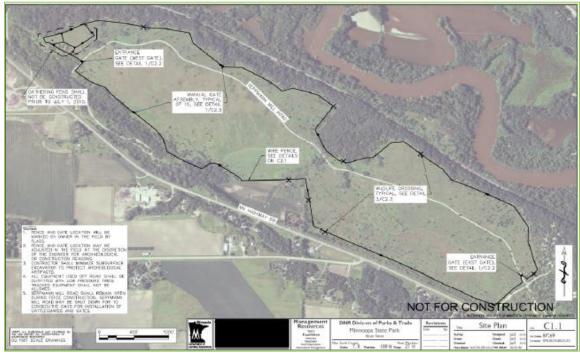
Vice President of Animal Programs

Minnesota Zoo

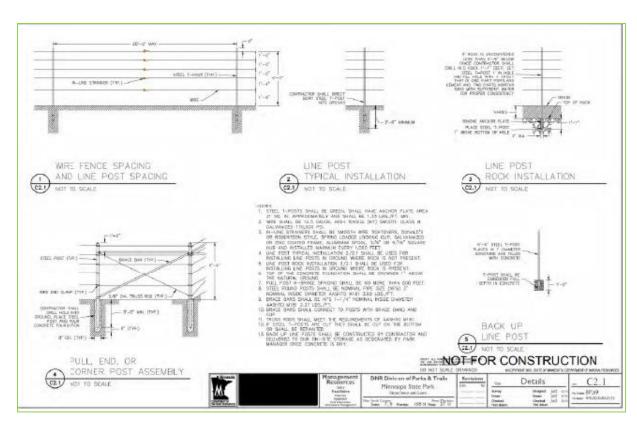
Kan Weller

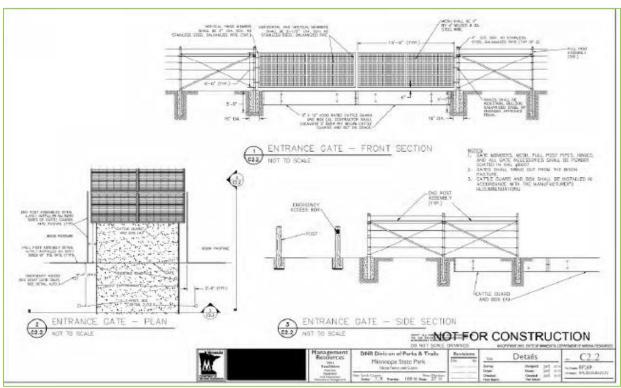




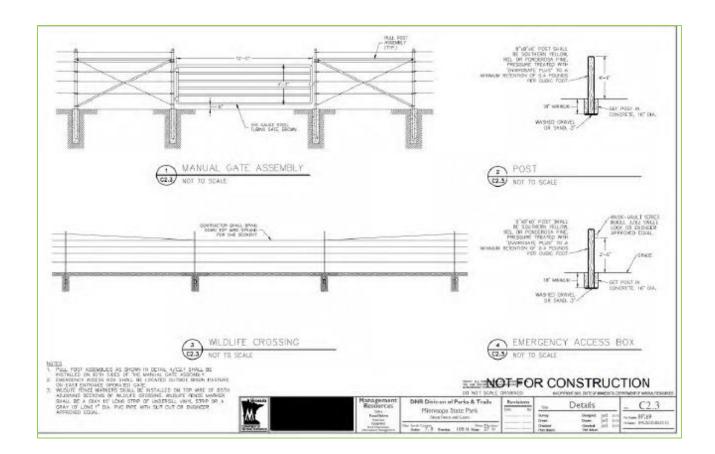








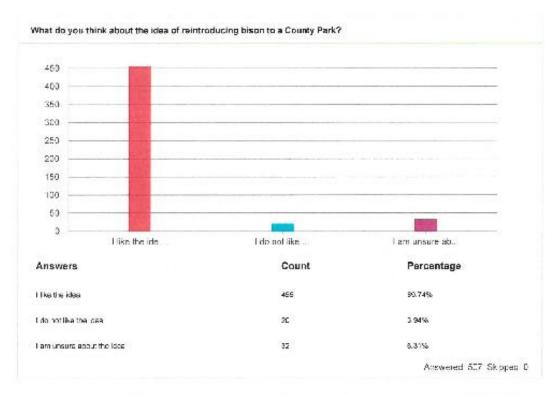


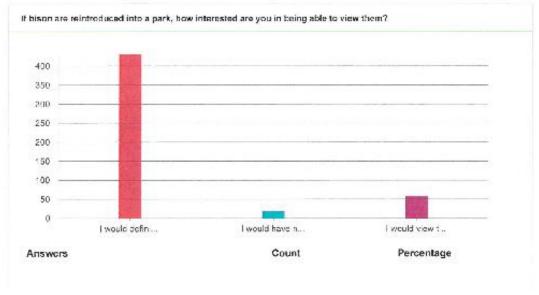




Appendix C Public Survey Results

Bison Survey

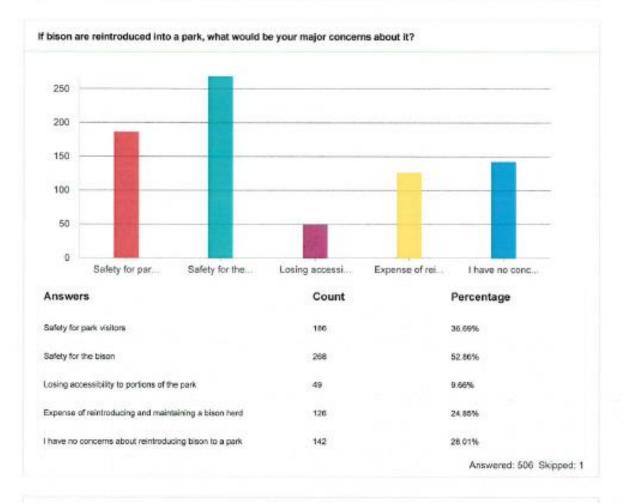




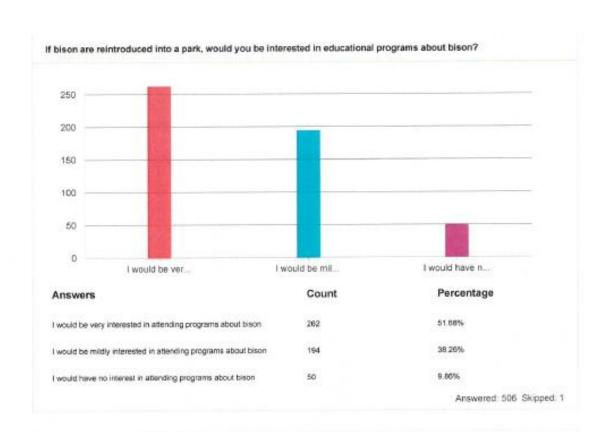


Bison Survey Page 2 of 15

Answers	Count	Percentage
I would definitely travel to the park for the opportunity to view the bison	431	85.01%
I would have no interest in viewing the bison	18	3.55%
I would view the bison if I was in the park, but would not make a speci- al trip to see them.	58	11.44%
		Answered: 507 Skipped:









Response	Count
Great idea.	2
Yes! A great idea. They were here first, before any white man. White man took them away in satronomical numbers with no regret or remorse for their loss and the people that respected them the most. Now is the time to bring them back to their homeland where they belong. BUTthey must be PROTECTED and RESPECTED to the fullest extent. I would ask the Native American community for their input as well. To me, that would be the most important thing to do first and then go from there. That's my 2 pennies worth.	£
Yes do it!	<u> </u>
Yay for Bisoni	1
Yas queen!	1
Would love the idea of reintroducing bison but am staunchly against using it solely as a medium for tourism and putting them at it he risk of ignorant citizens who wouldn't otherwise seek out wildlife and who are not educated. As long as it isn't a zoo then I lov e.t.	1
Without knowledge of the actual areas and plans on how bison will be used, it is a little difficult to answer these questions. In general, I am in support, but would really like to know the cost difference and drawbacks (mostly seeing the wallowing difference) of fusing bison as opposed to goats. Would you have enough area to keep bison year round? Would you move bison around or keep them in one place? If so, how would you move them since they are so big.	1
While there are significant management benefits from the grazing - which is great, I'd be interested to see the County explore the rich connection of bison and indigenous people's on this land. The MN DNR is doing some fun programming at Blue Mound S P - offering a prairie and bison tour in a jeep. It was prefly cool!	1
Which park are you looking at? I live near Lebanon Hills Park and would love to see them there.	1
What park and where?	1
What is the purpose? Is this for education or for the betterment of a heard?	1
What a great opportunity for lots of people to have a chance to see a buffalo	1
What a great idea!!	1
What a fantastic ideal PLEASE bring the Bison back!	1
We think this is a great ideal We have been to Blue Mounds and Mineopa State Parks to see the bison there.	1
We made a special camping trip to visit the bison in Minnocpa State Park. They had a great setup, but it was interesting that the y did not take the time to establish a native prairie before introducing the bison. They said they have to do maintenance on the laind and close portions to cut down shrubs and other non-natives periodically. So I would encourage establishing a large native prairie BEFORE introducing bison to develop a complete ecosystem that can maintain itself long term. Very interested to see when	1



e this would be in Dakota county.

Response	Count
we love visiting Minneopa State Park and went out of our way to visit that park because of the bison down there. We may never	1
have experienced any of that park ever if there had not been bison there. I sure hope that this could be used and introduced in o	
ne of our parks, the learning along about them would not only benefit people but our surrounding school districts who could take	
field trips.	
We have more important things to spend our time and money on in Dakota County. People can see bison at the Zoo or in a num	1
ber of private and public locations in Minnesota	
Very interesting ideal	1
Very cool idea Love the grants that are supposedly available to support such an endeavour.	1
This would be wonderful.	9
This would be great. We have seen real black at Theodore Roosevelt National Park and Blue Mound they are very fascinating a	1
nd would bring tourists.	
This will be a great tourist attraction, people will pay for it. I remember driving for miles for see Bosion.	. 1
This sounds like such an interesting idea that could educate the community, help bison, and bring visitors to Dakota County. Pie	1
ase consider iff	
This is very exciting!	31
This is vary cool. I'm excited to hear about which park you are considering.	,
This is their native lands let them roam! People need to learn to share the lands with animals. Thank you for this amazing opport	1
unity -for our kids to observe the wonders of the wild life!	
This is such a great idea. Visitor could see these amazing animals in the wild as apposed to a zoo. Great chance for students to	1
study and learn their history and how bison impacted the pest.	
This is just another waste of our tex dollars, STOP WASTING MY MONEY!!	1
This is an excellent idea - Minnesota can be a loader in restoring arimsts to the lands they once roamed and should again. That	1
nk you.	
This is an awasome ideal I believe this would have a significant influence on the youth of Dakota county and the surrounding an	-1
ea in the areas of conservation, history and biology. This would also bring in a lot of visitors to our park system and have a direct	
impact on our local accromy. Bison are one of North America's most fascinating animals and to have them this close is truly a w	
in/win for our community! Bravol	
This is also a great opportunity for field trips, bison represent so many areas of education. Science, ecology, American historyt	1
his would be an good contribution to the community.	
This is a great idea, especially if the land is permitted to return to its natural state. This is what at least a part of our park system	1
should be about. Look at Minneopa. They could use some more naturalizing, but they seem to be heading in the right direction.	
A lovely idea that should be gursued.	
This is a great ideal Looking forward to this great idea coming to life.	1
2015-25FE 100-25	



Response	Count
This has been done successfully in state parks across the state (Minneopa and Blue Mounds). They have good systems for kee	1
ping bison and visitors safe. I think Dakota county could do something similar.	
Think this over very carefully please.	1
They are aggressive, big animals. If one gets out, there will be problems. Bad idea.	1
The role of bison in contributing to restored habitat maintenance is for me the primary attraction.	1
The only reason I think that there could be a safety issue for people, is that some people just do incredibly stupid things. I really I like the idea.	1
The herd in Minnecpa SP is awesome. Something like that near the metro would be a big hit!	1
Thanks for reaching out to the public for input!	1
Thank you. Hope this plan comes to pass.	1
Such a neat ideal	1
Stop spending tax money on dumb shit	1
Sounds like a pretty cool idea to me.	1
Sounds fun	1
So, which park are you going to deny access to Humans using? Vermillion Highlands? Vermillion River WMA? Because you kno	1
w you can't wait to tell people they can't go there.	
Seems like a great idea for school field trips, as long as cost is reasonable.	1
Safety and expense, lower our taxes	1
Reintroducing native species is a great idea.	1
Reintroducing Buffalo to MN is an awesome idea.	1
Reintroducing bison to a Dakota County Park is an excellent idea. This will provide children and adults excellent educational opp	1
ortunities about our lands and animals. People will travel for these opportunities which will bring money into our county.	
Reintroducing bison into a Dakota county park is a great idea. My cursory concerns are primarily centered around the knucklehe	1
ads that would visit the park and get too close to the animals. Having said that, I also wouldn't want to see them in a small fence	
d area like a zoo (it would need to be a large fenced area). I've backpacked through a park in Virginia that had wild horses runni	
ng around and it was very cool, thanks, Mitch	
Professional ecologist answering here. They were native to pockets of habitat here. If possible, bring them back. Exact genetics	1
are likely gone.	
Please give me bison	3



Response	Coun
Please engage native communities in this process. The reason that the bison left Dakota County was tied to the government pu	1
shing out native communities, it is critical to acknowledge and heal that and this seems like an amazing opportunity to facilitate	t
hatI	
Please do itilii	1
please do it do not listen to the moms who think their kids are gonna get trampled by bison or whatever!!!!!	1
Please bring bison here	1
People forget that we are the guests, people are the visitors. The more we can get back to nature the healthier people are, the	a 1
nimals are and the planet is! As far as those few- Darwin has a theory and you can't regulate/legislate stupidity	
Outstanding idea	1
One of our favorite family trips was to Custer park in SD and seeing the bison was a great experience.	1
Ok, if in Spring Lake Park, It's big enough. Otherwise you could do cattle wilmovable fencing. Very little cost to the county	1
Oh yeah!	1
Obviously bison historically were free-ranging herbivores. I have some concern with introducing this majestic species and havin	1
g it managed as livestock and being confined to a small area. The health and well-being of the animals should definitely be take	
n into consideration when thinking about this opportunity. Thank you for soliciting public input.	
Not only do I think this is a good idea, I also think we should bring bison farming to MN. It would be a healthier alternative and r	n 1
ake buying ground bison cheaper.	
No thanks. Pot holes should be fixed.	1
Na	1
My initial feeling about the introduction of bison is quite positive. I would love to visit and view bison as long as there's enough	1
pace for them to roam freely.	
Minecpa State Park in Mankato has Bison. It is an attraction for the area. It's a great way to manage the land like it was when t	h 1
e bison were in this area.	
Majestic animal.	1
Love this idea!!!	1
Love this idea	1
Love the idea. Used to help out at Belwin Conservancy and actually did a study on them. Amazing animals and I think the way	1 1
hey set up their viewing areas is a great example to follow.	
Love the idea. People aren't always awesome so much main concern is someone being an idiot and putting the bison in dange	r. 1
Love the ideal	1



Response	Count
Love the idea and it is critical in furthering the goal of natural resources restoration, management and enhancement. It is the mis- sing piece! I also love the idea of having a herd nearby to view and would absolutely bring the family to bison related programs. Very exciting and cutting edge!	1
Love Bison, but people I am not such a fan off, People would endanger the Bison by trying to get to close, feeding them treating them like domesticated animals. So, the ability to keep people away from the bison with the possibility of sighting the buffalo would be of utmost importance. To protect the Bison from people.	1:
Like most things I see from this there is little information hear to be asking questions like what park are you taking about or what land?	1
Let's do iti	1
Let the buffelo roam. It is not up to humans to control nature. They were here for a reason. Stop screwing with nature. It always wins.	1
keep up the good work. Let's get out land back to a healthy, sustainable ecosystem. It benefits all of usil	1
Keep up the good work(?) Joefff	1
Just took my family to Minneopa State Park last weekend. Very cool experience. Would be great seeing these beautiful creature s roam free closer to home.	1
Joe, we know this was a joke that never ends! PLEASE be more considerate of funding these kinds of far out, help nobody, ide as. Absurd. LEAVE THIS TO OTHER PRIVATE ENTITIES - if there is grant funding, DO NOT APPLY. Dakota County DOES N OT need to spend another moment thinking or taking action on this idea. Leave this to rich people like Amazon owner or Bill Gat es.	r.
I've seen how people behave around buffalo and fear someone will find a way to get dangerously close to them.	1
I've seem Bison out west in Yellowstone National Park. They are magnificent creatures and they would be great to have around locally to observe.	1
Its an idea worth kicking around	1
Its a neat idea but where would you do it. Containing a small group in the urbanization around Lebanon hills would be difficult all so it is very high traffic etc. Would be fantastic if you could do on part of the UMore property (I realize its not county land but I dis like the planned expansion of Rosemount and hope there is more preserved park space). Few people go to Miesville so perhaps you are considering it. Shars bluff area would very pretty.	1
It's a great concept, just hope it's feasible.	1
It's a good idea.	1
It would be pretty cool	1
It looks like it's part of a ecology management program and not just a quasi-zoo gimmick, so am in favor	1
It is not clear whether this herd would be temporary or permanent. I'd be interested to know if other areas in the region have don	1



e this and what the results were. And are the tribes involved in the efforts?

Count Response It is great that the county is studying this, as a "natural" natural resource management tool and also to honor the history of this la 1 nd. I hope the county moves forward with this! It is good for the land too! Health of the soil. is there enough land to support the Bison? In Lee's Summit MO they have elk and I think some bison. There is a tall fence and a parking area where you can see them and 1 feed them carrots. If possible, that would be a great amenity in the Eagan area. If this is funded through a grant, how long will grant money be around to fund such a project? What happens to the herd when th e grant money is gone? I don't understand our county funding, but I feel like there are better things to spend our tax payer dollar s on other than a herd of bison. I would need to see proposed maps of where they would be and also expected costs vs other management practices. If they are 1 able to be in a primarily prairie situation I would be more for it. If the goal is calk Savannah then I would be hesitant as Bison do not appear to be the best and managing woody vegetation. After visiting herd at Mankato, there seems to be a lot of manageme nt needed to keep woodies down. The woody vegetation also restricts the view of public trying to see them. Burns appear to be harder to pull off with wet weather patterns. Curious to see if elk or goats could be figured into the design to help with woody infl ux. Things like what up front and long term costs would be used to make the fence able to hold other species of animals with the bison side by side or to lead or follow in a rotation. Glad to see the country exploring more natural methods that help motivate pe ople to visit the parks. I would love to see the reintroduction of bison as a tool in the management of our prairies and as a means of increasing biologic 1 al diversity. And they are magnificent creatures! I would love to see bison in the park! Bringing back a species to improve the health of the park seems like a no-brainer. I would just want to make sure that it is cost conscious. It is a great idea, and I support increasing bison herds, but I don't want it 1 to be a boundaggle. Would be a great thing to team up with the MN zoo, as they are working on increasing their herd. I would hate to lose usage of the parks I use to bison. My recollection is that bison can attack people so this would not be a goo d mix. Maybe I am wrong on that?? I would be very interested in knowing the costs involved with reintroducing bison to a Dakota County Park, but also the potential 1 hazards for not only the bison, but for the park goers as well. I wonder if the herd would be of enough size to have an effect of the state of the savanna in general. I would guess that the graz 1 ing and wallowing might be good for a small area of acreage, and I suppose the herd would like as much range area as they can get, maybe spreading the effect over too broad an area to be beneficial. I went to go see the herd in Yellowstone this summer and had a great experience. I would be interested to come see them espe. 1 cially if there were some programming around the natural ecosystem that integrated bison and their importance to the land. May be some outings could be sponsored at the Lebanon hills visitor center? I would be concerned people wouldn't take them seriou sly and do things that might put the bison in danger like driving up next to them.



I used to work doing prairie restoration and live near the park. I am really enjoying seeing more restored prairie land in Dakota C 1 ounty. We hiked the valley regularly and ride horse down there. I know the exotic species and aggressive natives are pretty out of control and am glad to see something done about it. Not sure how much of the valley would be set aside for bison grazing. I h. ope there will still be access to trails and fishing in the creek. Maybe start small and see what the feedback is regarding the biso n and the impact they are having. I understand the ecological reasons for the bisons and the draw they would have for the public but I am uncomfortable and conc. emed about how the bisons will be treated. Will they be killed and sold off when there are too many? Is there enough room in th e park to provide the distance needed from visitors to keep the bisons and humans safe? Will they attract coyotes and thus the c cyctes will be killed? Again, I think the idea of how they contribute to healthy prairies is cool and they would bring many visitors t o the park, but what price will the bisons pay? Thank you for your consideration in this matter. I think we should start reintroducing bison because it would be a great opportunity for a lot of people who would like to see them 1 who don't have the opportunity or money to drive down south to see them in a natural habitat instead of a zoo and it would be gr eat to see bison back roaming around where they once use to live and hopefully after this we can start to get more animal's and even plant's that use to live here that don't anymore I think this is an excellent ideal I'm a teacher in the area and might try to add field trips to the curriculum to come see the bison w 1 ith the students and talk about tribal history, etc. I think this is a very interesting idea. I think it would be amazing to see bison be reintroduced to this area. I think this is a great ideal I think this is a great idea and should be pursued more aggressively! I think this is a great idea and love the fact that Dakota County is considering this. Thank you for being good stewards of our lan 1 d and bringing it, back to the way it use to be! It is so important. My only concern would be for the safety of the bison themselves. and for those people who want to view them. I think this is a fantastic ideal I think this is a fantastic idea and I hope that it comes to fruition. I would help with efforts to restore the bison if given the opportunity. I think this could be a great ideal. I think this a wonderful idea. I applaud our County Park system for exploring this as a real possibility. It would be a great addition 1 to our park system, an educational tool and have a positive impact on our suffering environment. I think studied have shown that bison reintroduced to their natural area have shown a vast improvement in the ecosystem. I love 1 this idea. We'd be interested in purchasing a home near where they are released to observe them! Wonderful idea. I think reintroducing bison to Dakota County is a great idea. I think it's a wonderful idea. I love Custer state park and feel one of the greatest attractions there are the bison. I really love this i 1 dea. Great educational opportunity as well! I think it's a fantastic idea and I fully support reintroducing bison to a Dakota County park to encourage the native landscape of t 1 he local area

Count



Response

Response	Count
I think it's a wonderful idea!	1
I think it would be a great ideal	1
I think it is a great idea. I would like to see bison returned to our county.	1
I think it is a great idea. I visit the park in Washington County to see their bison often. It would be nice to have one available in D akota County tool	1
I think it is a great idea. It is past time to do it. Please do it and do it soon!	1
I think if you can use it as a learning tool, connecting to the Dakota County Tech college or Environmental HS that would be be a huge plus!	1
I think bison in the park is a beautiful idea and increasing the number of these animals helps recover our natural prairie habitats.	1
I think adding Buffalo to Dakota County is a great idea! Great for kids of all ages. How about some elk as well??	1
I suppose brucellosis to cattle is a concern, keeping Bison contained would be a concern, Keeping them safe from malicious pe- ople. Sounds fun, though	1
I support what is best for the bison. They should not be used as a tourist attraction.	1
I support returning bison to Dakota county. It would raise awareness in restoration efforts and in our parks in general. A concern I have is over-grazing. Looking forward to seeing these symbols of the prairie back where they once roamed.	1
I regularly include visits to bison herds whenever I travel. As long as the bison have respectful habitat and aren't reduced to a simallish meat producing beard or petting zoo, I'd be in favor. Engaging tribal communities and public schools in planning seem i important. Planners should visit Elk Island Park in Alberta to learn about proper ways to manage such an effort.	1
I question if bison would be an appropriate addition to our county park system. Would they primarily be a means to some other e nd (e.g. prairie restoration), or an end in and of themselves (e.g. bison viewing and education)? If the former, it seems like there must be other natural resource management tools and approaches that would be more broadly applicable to more (or even all) of the parks - including those that cannot support bison reintroduction. If the latter, I wonder if the Parks department should trade off other potential uses for the land the bison would occupy in order to own and maintain a captive herd for demonstration purposes - more like a zoo or nature center.	1
I may not be interested in educational programming - but my son and his two very young children would be so a huge WIN for u st	1
I love this idea!! I have family in South Dakota and a cherished childhood memory is seeing the bison in Custer State Park. I hope it works out.	1
I love this ideal We need our children to connect to the history of our state, and the unique aspects of our Midwest heritage.	1
I love this idea! This was their land first.	1
I love the ideal!	1
I love the idea and I would think it would bring revenue to small businesses as people from other communities would also come	1



Response	Count	
I lived in Dakota County for 26 years, and have always bragged about the greatest county park system I ever knew. Introducing	1	
Buffalo would be excellent, and would only increase my bragging.		
I like the idea, however the safety of the bison being kept in open space, not a penflot/kennel/barn, in a large enough area. This	1	
includes the escape of and possible motor vehicle and bison collisions. Big animals would definitely cause significant injuries, if t		
hey get to a highway. If these concerns can be met, sounds like a good idea.		
I just think that they are too big and dangerous!	1	
I hope we do this! Given the recent efforts to develop natural resource management plans and improve the condition of county p	1	
arks this makes a great deal of sense to implement. Whitetall Woods strikes me as a good starting point, especially if an arrange		
ment can be reached with the surrounding U of M and DNR properties. That large open space really needs to be preserved and		
made as natural as possible. We won't get a chance like that again,		
I honeatly shink it's a great idea.	1	
I hike in a lot of MN parks, as well as those in ND and WY where there are bison. If MN introduced bison in it's parks, I would car	1	
ry my .454 Casull revolver just like I do when I'm out west. I would worry more about bison than I do about bears.		
I have some concerns about bovine spongiform encephalopathy. Western States have had to destroy their wild herds and some	1	
farm stock to keep this disease in check. It would be a shame to see that happen here.		
I have been monitoring trail cam photos from Cedar Creek Park Reserve and the ones with the bison are fascinating. I think this	1	
would be a wonderful way to help bring the land in Dakota County Parks back into balance. Cedar Creek has commented about		
Dakota County's plans. I hope you contact them.		
I grew up in NO where there were herds of bison, school mascot was Bison, they aren't new to me. Reintroduce Bison to where	1	
they use to roam is a wonderful idea. They are a beautiful animal.		
I grew up in Devils Lake, ND with nearby Sully's Hill National Game Preserve. I loved the bison and the wildlife there. It would be	1	
great to have something like that around here.		
I feel this is a very good idea. Please do this sooner then later	1	
I believe the introduction of bison would make Dakota County a tourist destination and could be good for local businesses and e	a	
ducational for all ages:		
I believe introducing bison and including an educational program about them would be so beneficial. So many people do not get	1	
the opportunity to see bison other than in a zoo. What a great way to showcase the unique relationship between bison and prairi		
esl		
I am very much in favor	1	
I am not opposed to the idea. As long as their natural predators are around to keep the bison population under control.	1	
I am excited about the possibility of reintroducing bison to a Dakota County Park and would love to see it happen at Lebanon Hill	1	
ls. I don't know enough about the range and grazing requirements of bison, but am glad to see this being explored.		
I am concerned about the expense of having a herd in the park; disease that may spread between deer and bison; the loss of pa	1	



rk trails. If these concerns can adequately be addressed I think it would be great to restore bison to the park ecosystem.

Response	Count
How would you contain them so the stay in the park. What park in the county are you looking at?	1
How will you keep them in the park?	1
how soon can this be done?	1
Having some bison places part of our history back in its original place. I'm for it.	1
Great idea-love it!!	1
Great idea. Dakota County would be an outstanding place to visit.	1
Great idea. Hopefully grant funding would be available to assist with costs.	1
Great idea!!	1
Great ideal There are many parks in MN and Dakotas that I hope Dakota county partners with (along with the MN Zoo) to address all key aspects and possible issues that may arise with a reintroduction (everything from animal safety to community education).	1
Great idea Dakota County!	1
Great idea and what a great educational opportunity for the children and adults. Over population might be a problem over time.	1
Great idea and let's do it. We should have federal government pay for it too. After all they are the ones who did what they did ion	1
of time ago. They may have apologized and paid some and they can pay more 🚳	
Good ideal Belwin in Afton has had success with this, too.	1
So for it! Would love to see those beautiful creatures back on our prairies.	1
Go for it!	1
Fund local ROADS. Parks are important but this is a Useless meaningless way of spending money we shouldn't be spending. T his kind of thing is for eccentric billionaires to donate to the county not the county paying to re-introduce bison.	t
Fantastic ideal	1
excellent idea. I've spent a number of fine days in Custer State Park in South Dakota and observed lots of others visiting there to. They were from all over based on their license plates. It seems like that could indicate possibility of a significant tourist draw.	1
every time I am in Jamestown, ND I walk the park & visit the bison there. It's a unique attraction. It can provide history of the Ian I, animals, and people that lived here before it was settled by pioneers (as well as their history). I think it is a really unique opportunity to highlight the history & provide conservation in the county.	1
con't use Lebanon Hills for the bison but could see them at Whitetail Woods where there is a lot of less developed landnot as namy trails and other activities there compared to Lebanon. It's been awhite since at Lake Byllesby but maybe there. In looking it the map that may not be feasible as many trails and the take of course.	1)
on't hire full time staff, make it available for school field trips.	1



Count Response Do the individuals interested in introducing Bison into the park know how substantial the confainment fencing will have to be? I h 1 ave visited several parks with just a few Bison in them. The fence posts resemble telephone poles and the fence material is very substantial. Despite this all, I was not sure I was safe as a spectator when a bull charged the fence. This is someone's pipe drea m!!! They are in La La land. It is not practical!!! Do it. Do it now. 5, 4, 3, 2, 1. Do it. Now. Right now. DO ITIII Dekote County parks have a tradition of providing nature experiences and non-conventual programs and services that local citie 1 s do not. A bison herd and associated programs would be an excellent and unique addition to the park system. Heritage and cult ure are important facilities and programs to support. This would be an excellent addition to the quality programs and facilities Da kota County already provides while supporting the historical aspects of our region. Dakota County is known for making smart decisions! I have no doubt this is one! Something unique and different in the Metro Ar 1 ea. And rebuilding a population of animal that once dominated the landscape. Go for it!! Dakota County already has one zoo, in fact quite a large zoo. Why do we need another one, this one dedicated to only one anim 1 al, American Bison. This is a stupid enough idea that I still suspect it is one of Joe's April Fools jokes. A stupid, STUPID idea, so insane that I suspect the person who came up with it was drunk at the time, or perhaps an illicit marijuana abuser. Captive Bison in regional and State parks require very secure perimeter fencing, they are strong, wild animals. If the intent is to 1 move them about within the park additional very strong fencing would be required in all areas. There is also the issue of pure Bis on genetics, I strongly suggest working with the DNR and the MN Zoo as they have years of experience managing Bison on pub lic land access to visitors. Bring the bison!! Bison were a natural part of our past landscape and should be brought back to Dakota county and any other region in the US. Bison rock! Bison are an important aspect of Minnesota and Dakota County's history and the preservation of our natural resources is one of the many things I value about living here. Biggest concern would be safety of the animals. If that is taken care of and the animals would have good quality of life in their en 1 vironment I would be very supportive. I personally would not likely partake of programs for them but would like them available for others. If the animals would be safe and happy I see it as an asset to the county. Assuming Bison are not free range and that they are very strong animals, please share how they will be kept in the park. As a city employee working in environmental resources, I would love to have this be a pilot program we could use to inform our f -- 1 uture decisions for park management! Are you flippin nuts????? Next thing is you will want to stop cars from entering the county because it MIGHT disturb the herd. Di 1 d we allot too much money so you can study this??? Adding them to Minneopa park in Mankato has been Avery positive experience. Absolutely ridiculous idea.



Response	Count
A great ideal I hope you get support to make it happen!	1
	0
	Answered: 206 Skipped: 301



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