FIRST PEOPLES BUFFALO JUMP STATE PARK

Prairie Dog Management Plan &

Environmental Assessment

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Introduction

Montana State Parks (MSP), a Division of Montana Fish, Wildlife & Parks (FWP), proposes to manage the black-tailed prairie dog population at First Peoples Buffalo Jump State Park in order to protect cultural, archeological, and heritage resources at the park.

Black-tailed prairie dog colonies are causing damage to cultural and archeological resources at First Peoples Buffalo Jump State Park (FPBJ or First Peoples Buffalo Jump, hereafter). Designated a National Historical Landmark by the National Park Service in 2015 after decades of research, First Peoples Buffalo Jump contains outstanding heritage resources, and their protection is the highest priority of the park. Prairie dogs have expanded their territory in and adjacent to the park ten-fold since 1996, and appear likely to continue to expand their territory. Where prairie dogs and cultural resources overlap, prairie dog activity is moving, burying, and potentially destroying cultural, archeological, and heritage resources. MSP proposes to control prairie dogs where such damage is occurring.

Black-tailed prairie dogs are currently estimated to occupy 2.4 million acres in North America (Hamilton, 2009, 63348), including more than 190,000 acres in Montana (Rauscher et al., 2013). There is only one buffalo jump of FPBJ's size and quality in the United States (Aaberg, 2013). Consistent with FPBJ's primary objective—heritage resource protection—and the overall vitality of the prairie dog population, the unique heritage resources at First Peoples Buffalo Jump State Park need to be protected from prairie dogs.

The Montana Environmental Policy Act (MEPA) (Montana Code Annotated[1] Title 75) requires state agencies to analyze the impact of state actions on the human environment in a systematic, interdisciplinary manner. An Environmental Assessment is utilized by agencies to facilitate transparency and public discussion, and to determine whether impacts to the human environment are significant and therefore necessitate, under MEPA, an Environmental Impact Statement. This Draft Environmental Assessment outlines MSP's proposed Prairie Dog Management Plan and discusses potential alternative courses of action. MSP has reached the conclusion that the proposed action does not significantly affect the human environment. MSP welcomed public comment regarding: a) this environmental analysis; b) the proposed action; and c) the determination that adverse impacts from the proposed action are not significant. MSP utilized comments to inform a final decision regarding the First Peoples Buffalo Jump State Park Prairie Dog Management Plan.

[1] Hereafter MCA.

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1. Purpose of and Need for the Proposed Action

Montana State Parks proposes to manage the black-tailed prairie dog population at First Peoples Buffalo Jump State Park in order to protect cultural, archeological, and heritage resources whose integrity is threatened by prairie dog burrowing. Any action by a state agency must be evaluated for potential environmental impacts under the Montana Environmental Policy Act (MEPA). This document comprises MSP's proposed action and MEPA evaluation.

1.1 Background and Threat to Resources

The purpose of this plan and environmental assessment is to actively manage the black-tailed prairie dog population at First Peoples Buffalo Jump to protect the cultural, archeological, and heritage resources of the park; protect public health, safety, and welfare; conserve natural processes and conditions; and manage park resources in accordance with the park's 2005 Management Plan and other relevant guidance.

First Peoples Buffalo Jump State Park, at 2,180 acres, is located in central Montana, approximately 14 miles southwest of Great Falls. The park is managed by Montana State Parks, a division of FWP. First Peoples Buffalo Jump State Park is the most significant, best preserved, and largest buffalo jump in the United States, rivaled globally only by the Head-Smashed-In Buffalo Jump World Heritage Site in Alberta (Aaberg, 2013). Native Americans used the site for roughly 6,000 years to herd buffalo off the cliffs to provide for their annual food supply (Aaberg, 2013). Important historical features at FPBJ include pre-contact tipi rings, trip walls, bison butchering areas, campsites, and over 1,300 bison drive line features (Scott, 2011). In 2015, First Peoples Buffalo Jump State Park was designated a National Historical Landmark by the National Park Service, recognizing the exceptional importance of the site in preserving and presenting the heritage of Montana's first peoples. Protecting FPBJ's nationally-recognized heritage resources is MSP's primary objective at FPBJ State Park; by "heritage resources" MSP means those aspects of the site that contribute to the site's heritage, traditional cultural, and archeological integrity (see Section 2.1).

Black-tailed prairie dogs (*Cynomys ludovicianus*) "are herbivorous, diurnal, colonial, burrowing ground squirrels" (Nistler, 2009).[2] It is unclear whether prairie dogs inhabited FPBJ proper prior to the mid-1990s, but black-tailed prairie dogs are native to this part of central Montana. Prairie dogs serve an important ecological role as prey and in terms of environmental modification (Rauscher et al., 2013). Retention of a prairie dog population at FPBJ State Park is aligned with MSP's overall mission, provided that it is consistent with protection of heritage resources. Over the last 20 years the black-tailed prairie dog population at FPBJ has grown from a single colony of 60 acres in 1996 to a complex with nine colonies together exceeding 588 acres, at least a ten-fold increase.

The prairie dog population is causing damage to heritage resources at FPBJ. Prairie dog burrows cover the same area as significant archeological features at the park. Individual prairie dog burrows each reach depths of three to 15 feet, and lengths of 13 to 109 feet (Hoogland, 1995; Sheets et al.,

[2] In this document, "prairie dog" refers to the black-tailed prairie dog unless otherwise specified; white-tailed prairie dogs are the only other prairie dog species endemic to Montana, and occur only within a very restricted range.

1971), while mounds at burrow entrances are generally one to two feet high (Montana Department of Agriculture, Revised 2014). Burrowing disturbs artifacts and other material above ground and below, potentially damaging artifacts; altering surface features which are critical to "reading" historical use of the site; and, by stratifying buried artifacts based on size, damaging our ability to understand the temporal relationship between artifacts (Scott, 2015)(Balek, 2002; Bocek, 1986).

Specifically, prairie dogs are burrowing under some drive line cairns at FPBJ and burying others. MSP's application for National Historic Landmark status (Aaberg, 2013), for example, stated that "portions of a prairie dog town encompass [a particular driveline], resulting in destruction of some cairns by burrowing. If prairie dog expansion continues, this adverse activity will impact additional alignments." Prairie dog burrowing has also destroyed portions of a site that contains tipi rings, time-sensitive artifacts, and potentially dateable organics (Aaberg, 2013). Tipi rings at FPBJ are more-than-usually significant because "Archeological excavation and use of optically stimulated luminescence dating may allow for tipi ring age determinations that pre-date the earliest known use of tipi rings in Montana and much of the western United States" (Aaberg, 2013).

Consistent with MSP concerns, the Montana State Historic Preservation Office has expressed concern over the damage from prairie dog activity at First Peoples Buffalo Jump:

> *While some effects such as transport and mislocation of carbon 14 sample material may be unlikely at First People's - were that material found to be present it would be a critically important loss. More obvious impacts are krotovinas (sediment filled burrows) resulting in churning and translocation of soil matrix in extensive underground cavities and tunnels. Lithic scatters may "disappear." Partial to complete disturbance of the soil matrix can occur. Also obvious is the lateral and vertical movement of even large stones in rock alignments, stone rings and other surface features. Rock cairns collapse. [...] The visibility of the surface features at First People's is a critical and highly invocative value to public interpretation and broader Native American community values. This visibility is in the process of being severely diminished. We concur that the prairie dog activity is extremely detrimental and should be vigorously addressed.*

Where prairie dog burrows overlap with heritage resources, they conflict with the primary objective of the park: preservation of unique cultural, archeological, and heritage resources. MSP believes that failure to remove the prairie dogs that are impacting heritage resources would be a failure to protect these important and irreplaceable artifacts. Accordingly, this document assesses different potential strategies for managing the prairie dog population to protect heritage resources. This environmental assessment considers only management activities on land within FPBJ boundaries; it considers potential cumulative impacts from actions by private landowners and/or Montana Department of Natural Resources and Conservation (DNRC) to the extent determinable. This assessment will result in a Prairie Dog Management Plan for First Peoples State Park which MSP will implement.

1.2 Management Objectives

The objectives of the First Peoples Buffalo Jump State Park Prairie Dog Management Plan (2005) are, in order of importance, to:

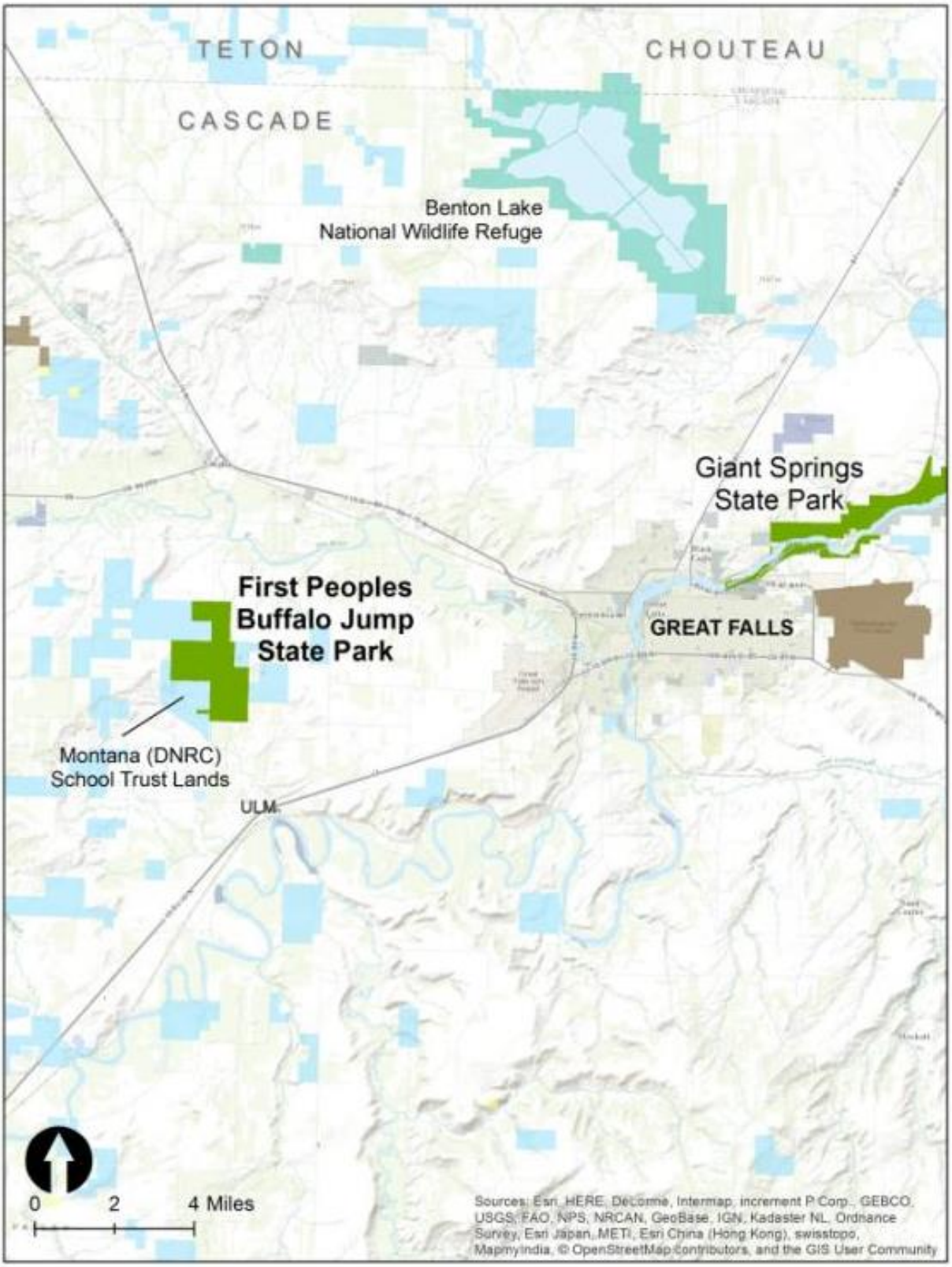
1. Protect cultural, archeological, and heritage resources from damage.
2. Retain or restore ecological conditions likely pertaining prior to European-American settlement, including the potential presence of prairie dogs, to the extent such conditions are determinable and achievable.

To accomplish those objectives, this assessment evaluates alternative potential management strategies and their potential effects.

1.3 Location

First Peoples Buffalo Jump State Park is located in central Montana, approximately 14 miles southwest of Great Falls between the Sun and Missouri River Valleys (see Figure 1). The park is surrounded by state school trust lands administered by DNRC and by private lands. The park encompasses the cliff over which bison were guided, the drivelines on the benchland leading to the cliff, and some of the flatlands below the cliff.

FIGURE 1. FIRST PEOPLES BUFFALO JUMP STATE PARK REGION



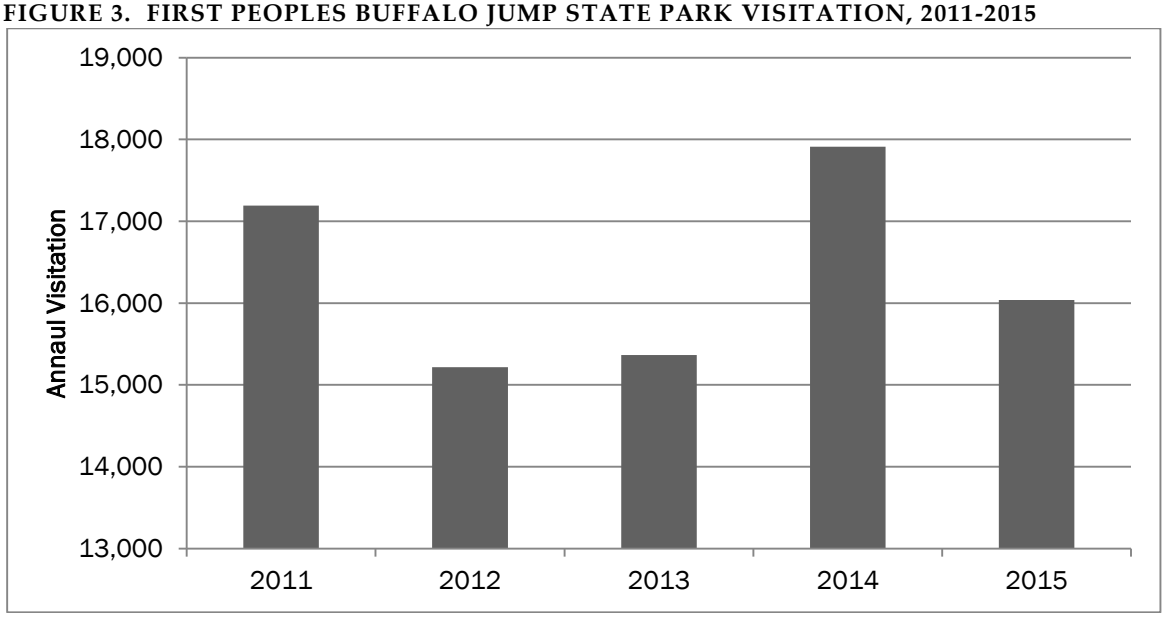
1.4 Current Management

First Peoples Buffalo Jump State Park is managed according to its 2005 Management Plan. First Peoples Buffalo Jump State Park specifically welcomes Native American use for worship, celebration, and reconnection with ancestors. The jump was within the traditional territories of the Shoshone, Blackfeet, Salish, Kootenai, and Kiowa (Scott, 2011). The cliffs figure prominently in oral histories of American Indian tribes, including the Nez Perce, Shoshone, Bannock, Salish, Kootenai, Crow, Assiniboine, Gros Ventre, and Blackfeet (Thompson, 2016). The park is today used for periodic ceremonies by the Blackfeet, Chippewa-Cree, and Little Shell Chippewa, and is visited by individual members of other tribes for ceremonial or other purposes (Thompson, 2016).

FIGURE 2. FIRST PEOPLES BUFFALO JUMP STATE PARK, AUGUST 2016.

FPBJ provides a diverse range of recreational and educational opportunities for the general public. The park averaged over 16,000 visits per year from 2011 to 2015 (see Figure 3). A modern visitor center below the cliff was opened in 1999 and features interpretation of native peoples' daily life and programming detailing the importance of bison to native people of the Great Plains. Three miles of trails between the visitor center and the top of the jump provide opportunities for visitors to experience a native grassland prairie ecosystem; the cliffs of the buffalo jump; stunning vistas; a rich, cultural landscape; and wildlife including prairie dogs and other species.

FIGURE 3. FIRST PEOPLES BUFFALO JUMP STATE PARK VISITATION, 2011-2015



Public recreation activities specifically associated with prairie dog colonies in the park consist of viewing or photographing black-tailed prairie dogs and associated wildlife species in their natural habitat.

1.5 Relevant Plans, Laws, Rules, and Documents

Management decisions at First Peoples Buffalo Jump State Park are subject to a number of federal, state, and inter-state policies, and are tiered to MSP's statutory, regulatory, and policy direction. MSP intends to actively manage prairie dogs and habitat in First Peoples Buffalo Jump State Park consistent with the following plans, laws, and environmental compliance documents:

- Endangered Species Act of 1973 (16 U.S.C. 1531-1544 87 Stat. 884)
- Montana Environmental Policy Act (MCA 75-1-102(1))
- Historical Sites Act of 1935 (54 U.S.C. 320101-320106) and National Historical Preservation Act of 1966 (54 U.S.C. 300101 *et seq.*)
- Montana Antiquities Act (MCA 22-3-421 to 22-3-442)
- Montana Fish, Wildlife & Parks Cultural Resources (Administrative Rules of Montana[3] 12.8.501 to 12.8.510)
- Montana Pest Management law (MCA 80-7-1101)
- Prairie Dog Management prepared by Montana Department of Agriculture (Montana Department of Agriculture)
- Ulm Pishkun State Park Management Plan (2005)
- First Peoples Buffalo Jump State Park Heritage Resource Preservation Plan (2011)
- Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group, 2002)
- Multi-State Conservation Plan for the Black-Tailed Prairie Dog (Luce, 2003)

[3] Hereafter ARM.

1.5.1 General Authority

MSP is charged with jurisdiction of state parks "For the purposes of conserving the scenic, historical, archaeologic, scientific, and recreational resources of the state, providing for their use and enjoyment, and contributing to the cultural, recreational, and economic life of the people and their health" (MCA 23-1-101, 102). This directive grants MSP the discretion to navigate the tensions between conservation of resources and the use and enjoyment of resources. The proposed management plan is consistent with this direction.

1.5.2 Heritage Resources

In 2015, the U.S. Department of the Interior National Park Service (NPS) responded to a nomination from MSP by designating First Peoples Buffalo Jump a National Historical Landmark (NHL) (see 36 CFR 65.1 - 10). NFL listing is an exclusive designation that has been bestowed on about 2,500 sites nationally (see https://www.nps.gov/nhl/). "The purpose of the National Historical Landmarks Program is to focus attention on [historical] properties of exceptional value to the nation as a whole rather than to a particular State or locality" (36 CFR 65.2(a)), and First Peoples Buffalo Jump was designated due to its importance to Native American history and culture, and its importance, thereby and as well, to the people of the nation as a whole. FPBJ is the largest and most significant buffalo jump in the United States (Aaberg, 2013). NHL listing (like the listing on the less-exclusive National Register of Historical Places that FPBJ has enjoyed since 1972) does not impose any federal restrictions on management of a listed property; rather, it recognizes important qualities and makes properties eligible for certain historical preservation grants. Managing First Peoples Buffalo Jump to protect cultural, archeological, and heritage resources is consistent with the recognition of the site's national importance.

Montana state law requires that state agencies work to protect "heritage properties"[4] such as First Peoples Buffalo Jump on state-owned lands (MCA 22-3-424). FWP will therefore consider heritage properties "for the purpose of preserving the properties and to avoid, whenever feasible, department actions or department assisted or licensed actions that substantially alter heritage properties or paleontological remains on those lands" (ARM 12.8.501). The Montana Antiquities Act (MCA 22-3-421 to 22-3-442) and FWP ARM rules (12.8.501 to 12.8.510) call for the protection of significant heritage properties.

The proposed FPBJ Prairie Dog Management Plan, in taking steps to prevent harm to a heritage site and to cultural and heritage resources, is consistent with the Montana Antiquities Act and other general direction.

1.5.3 Authority to Manage Prairie Dogs

Responsibility and authority to "supervise Montana's wildlife" are given to the Montana Department of Fish, Wildlife & Parks (Section 87-1-201, MCA). The Administrative Rules of Montana (12.8.102) state that "management will be directed toward retention of state parks in as near a natural condition as possible, without impairment of ecological features and values." The black-tailed

[4] "Any district, site, building, structure, or object located upon or beneath the earth or under water that is significant in American history, architecture, archaeology, or culture" (MCA 22-3-421).

prairie dog is a natural and important part of the short-grass prairie that once covered this portion of Montana.

The black-tailed prairie dog has been the subject of considerable attention due to its decline from historical population levels and its relationship with the endangered black-footed ferret, an obligate species that cannot survive without prairie dogs (Kotliar et al., 2006). The U.S. Fish and Wildlife Service (USFWS), charged with administration of the Endangered Species Act, listed the black-footed ferret as an endangered species in 1967.[5] To MSP's knowledge, black-footed ferrets do not occur at First Peoples Buffalo Jump State Park, and the complex is not large enough to support a viable ferret population (Knowles, 2012). Accordingly, the Endangered Species Act should not be implicated by management decisions at the state park. However, any prairie dog control efforts would be preceded by a review of the affected area for nongame wildlife, including black-footed ferrets.

In 1998, USFWS was petitioned to list the black-tailed prairie dog as a threatened species. In 2000, based on estimates that black-footed prairie dogs survived at roughly 2% of their historical population levels (Manes, 2006, 174), USFWS determined that listing was warranted but precluded by other priorities (Hamilton, 2009, 63344). Potentially affected states, in response to the petition to list, undertook conservation measures. As part of this effort, the Montana legislature augmented the prairie dog's existing identification as a vertebrate pest in need of suppression by the Montana Department of Agriculture (MCA 80-7-1101) with dual listing as a nongame species to be managed for perpetuation by FWP (Montana Fish Wildlife & Parks, 2007). Montana, via FWP, also joined other affected western states in developing the multi-state Black Tailed Prairie Dog Conservation Assessment and Strategy and its addendum, the Multi-State Conservation Plan for the Black-Tailed Prairie Dog (Luce, 2003). As part of the multi-state effort a collaborative group of state, federal, and tribal actors led by FWP devised the Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group, 2002).

The inter-state conservation effort, as well as improved population estimates, prompted USFWS to drop the black-tailed prairie dog from threatened candidacy in 2004. Since 2004 USFWS has rejected a second petition for listing (Hamilton, 2009), and Montana's classification of prairie dogs as nongame wildlife lapsed and was not renewed, leaving them classified only as vertebrate pests (Montana Fish Wildlife & Parks, 2007). Montana remains party to the multi-state conservation plan and continues to observe the Montana Conservation Plan (Montana Prairie Dog Working Group, 2002), which established abundance and distribution goals for black-tailed prairie dogs in Montana, and suggested strategies for achieving them.

The proposed Prairie Dog Management Plan for First Peoples Buffalo Jump is consistent with general management direction and the Montana Conservation Plan. The most recent population estimates for Montana (completed in 2008) determined that active prairie dog colonies in Montana occupied more than 77,000 hectares (190,000 acres), almost twice the 42,000 hectares targeted by the Montana Prairie Dog Working Group in 2002 (Montana Prairie Dog Working Group, 2002; Rauscher et al., 2013), indicating that Montana is meeting the distribution and abundance goals articulated in

[5] The U.S. Department of the Interior produced the first such listing in 1967 under the authority of the Endangered Species Protection Act of 1966 (U.S. Department of the Interior Fish and Wildlife Service, 2013).

the Conservation Plan. Further, the Montana Conservation Plan recognizes that either eradication or density reductions of prairie dog colonies may be necessary or desirable in specific instances where prairie dog activity conflicts with other values (Montana Prairie Dog Working Group, 2002, 22).

1.5.4 First Peoples Buffalo Jump State Park Management Plan

To comply with general guidance and devise site-specific policy, MSP develops management plans for state parks. The 2005 Management Plan for FPBJ seeks to protect cultural and biological values at the park. The Management Plan directs that "The natural, cultural, and physical resources of the park will be managed to approximate their state at the time the site was used as a buffalo jump." The plan states that "preservation of the native open prairie lands and the flora and fauna that constitute the view shed will be a priority for the park." The Management Plan also discusses the threat to park resources that prairie dogs had, even in 2005, begun to present, and called for preparation of a Prairie Dog Management Plan like this one to both protect park resources from prairie dog impacts and retain black-tailed prairie dogs.

MSP has also completed a Heritage Resource Preservation Plan (Scott, 2011) for FPBJ elucidating park management strategies to protect heritage resources from vandalism, illegal collection, and other threats. The Heritage Plan does not speak directly to prairie dogs.

1.5.5 Shooting

Shooting prairie dogs within the boundary of the park is expressly prohibited due to public safety concerns and in accordance with Administrative Rules of Montana 12.8.202.

1.5.6 Good Neighbor Policy

Montana statute directs that MSP observe a "good neighbor" policy, attempting to shield neighboring landowners from impacts such as trespassing and invasive weeds related to recreational use (MCA 23-1-126, 23-1-127). As a matter of courtesy and in compliance with this policy MSP takes into consideration neighbors' concerns regarding prairie dogs and other issues.

1.5.7 Summary

With this Prairie Dog Management Plan MSP complies with all relevant direction by protecting and preserving important cultural, archeological, and heritage resources at FPBJ. The plan also complies with the Montana Prairie Dog Conservation Plan and other direction relevant to wildlife protection. MSP believes this plan navigates the tension between protecting unique heritage resources and conserving the nongame wildlife species that imperils them.

2. Cultural, Archeological, and Heritage Resources

2.1 Definitions

As noted above, FWP is charged with protecting "the scenic, historical, archaeologic, scientific, and recreational resources of the state" (MCA 23-1-101). All state agencies are required to take into consideration the effect of projects on "heritage properties," where a heritage property is "any district, site, building, structure, or object located upon or beneath the earth or under water that is significant in American history, architecture, archaeology, or culture" (MCA 22-3-421).

To meet these duties, MSP considers such impacts at FPBJ in three categories: impacts to archeological resources, impacts to cultural resources, and impacts to heritage resources.

Archeological Resources
The National Register of Historical Places defines an archeological site as a place "where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains" (Little et al., 2000, 7). An archeological resource is one of those physical remnants or any other feature that facilitates such interpretation. Archeological resources at FPBJ are grouped into 42 important features that provide insight into pre-contact Native American culture and practices (Aaberg, 2013).

Cultural Resources
MSP regards FPBJ as a traditional cultural property. As Parker (1993) identifies, in National Register programs,

> *A 'traditional cultural property' is a property, a place, that is eligible for inclusion on the National Register of Historical Places because of its association with cultural practices and beliefs that are (1) rooted in the history of a community, and (2) are important to maintaining the continuity of that community's traditional beliefs and practices.*

Montana tribes, particularly the Blackfeet, Chippewa-Cree, and the Little Shell Chippewa, continue to utilize FPBJ for ceremonies and other purposes; this use is rooted in the history of their respective tribes and is important to maintaining the continuity of the tribes' traditional beliefs and practices. Accordingly, MSP understands FPBJ to be a site that meets the definition of a traditional cultural property, and here defines "cultural resources" as those aspects of FPBJ (archaeological features, artifacts, etc.) that contribute to its integrity as a traditional cultural property.

Heritage Resources
MSP considers "heritage resources" to be an umbrella term under which both archeological, historic and traditional cultural resources fall, and which also includes other aspects of a site or object that contribute to its value as a heritage property.

Impacts to these three types of resources occur when they diminish the resources' integrity. In this context MSP defines integrity in the same way that the National Park Service (1999, 36) does for a historical property:

Integrity is the ability of a property to convey its historical associations or attributes. The evaluation of integrity is somewhat of a subjective judgment, but it must always be grounded in an understanding of a property's physical features and how they relate to its historical associations or attributes. The NHL Survey recognizes the same seven aspects or qualities of integrity as the National Register. These are location, design, setting, materials, workmanship, feeling, and association.

In shorthand, MSP seeks to maintain FPBJ's heritage resources' "integrity of relationship and integrity of condition" (Parker, 1993).

2.2 Site History and Resources

First Peoples Buffalo Jump is one of the oldest, largest, and best preserved bison jumps in North America (Scott, 2011). The landscape encompassed by the Jump lies within traditional territories of many tribes including the Shoshone, Blackfeet, Salish, Kootenai, and Kiowa Indians (Scott, 2011). Archeological research in the early 1990s found substantial evidence of jump use, including bison bones, projectile points, and animal processing tools, dating as far back as 300 AD. More recent research has shown that the site was likely used from approximately 4000 BC to 1750 AD (Aaberg, 2013).

FIGURE 4. TRIP WALL AT FPBJ

Mass procurement of bison was one of the most productive methods devised by pre-contact people for obtaining large quantities of food and hides from a single hunting event. The carefully laid out landscape design at First Peoples Buffalo Jump reflects the culmination of thousands of years of shared and passed-on knowledge regarding the Northern Plains environment and topography and the behavior and anatomy of bison. Judging by the unusually extensive area that was used and the depth of its bison bone midden deposits, pre-contact peoples identified First Peoples Buffalo Jump as an especially effective location for mass procurement of bison. It is evident that careful design and exact placement of drive lines and bison trip walls enhanced the site's topography; the trip walls are unique to First Peoples (Scott, 2011).

The buffalo jump is a 30-foot-high sandstone cliff called Taft Hill that extends for approximately one mile. The site was first designated a State Historical Monument in 1971 and then a State Park in 1972. Originally referred to as Ulm Pishkun, the name of the park was derived from the Blackfeet word "Pis'kun," meaning "deep kettle of blood," and the nearby town of Ulm. The site was added to the National Register of Historic Places in 1974. The park was renamed in 2007 to provide a more descriptive title that would attract the public and evoke cultural sensitivity and unity (Scott, 2011; Ulm Pishkun Advisory Committee and Montana Fish, 2005).

In 2015, the park was designated a National Historical Landmark, a high-level designation by the Secretary of the Interior that recognizes nationally significant historical places that possess exceptional value or quality in illustrating or interpreting the heritage of the United States. The only other site that approximates First Peoples Buffalo Jump's antiquity, integrity, extent, and number and variety of contributing elements is Head-Smashed-In Buffalo Jump, a UNESCO World Heritage Site located in Alberta, Canada (Aaberg, 2013). There is no site like FPBJ in the United States.

FPBJ provides a window into native peoples' way of life and the economic importance of buffalo to the Great Plains Indian tribes. There are 1,300 stone cairns on the hilltop above the cliffs that are the remains of drivelines Native Americans used to guide buffalo to the cliff edge. Twenty-two tipi rings indicate camps that existed on top of the cliffs when drivelines were not in use. Archeological investigations have revealed that native peoples camped on the bench adjacent to the cliff base as well. Native people gathered in the area around the park's cliffs to hunt, celebrate, and feast. The 2011 Heritage Preservation Plan outlines the various feature types found in 2008 with a brief description as follows:

FIGURE 5. HISTORICAL FEATURES SURVEYED AT FIRST PEOPLES BUFFALO JUMP S.P., 2008

Feature	Description
Stone Alignments/ Drive Lines	Characterized by rock cairns consisting of generally 4-15 rocks or more that follow a linear pattern used to drive or haze bison towards the cliffs at Taft Hill.
Tipi Rings	Circles of stones which once held down bottom edge of a tipi and helped keep out cold and drafts. Size ranges from 4-7 meters in diameter. One very large circle may have been used by a larger group for ceremonies.
Cultural Material Scatter	Features are evidenced by chipped stone tools and flakes that resulted from the sharpening or creation of stone tools.
Rock Cairns	Singular rock cairn features that did not serve as part of an alignment.
Trip Walls	Unique to First Peoples and have not been documented elsewhere in Montana. Include stacked rocks that are approximately 30-90 centimeters off the ground and are comprised of 1000s of stones. Features are generally at least on meter wide and 15-40 meters long.
Historical Sites	Total of nine historical features were recorded, including depressions, stone buildings, wells, and homesteads.

More recent history at the site includes homesteading and the operation of a stone quarry between 1889 and 1905. Bone mining occurred from 1945 to 1947 at the site, using the buffalo bone meal for cattle-feed supplement and fertilizer. Artifact collecting began in the 1950s and 1960s, prompting early efforts to establish the area as a state park to protect the valuable cultural resources.

Because FPBJ plays a prominent role in the oral histories of several Native American tribes, and continues to host ceremonies and other visits from tribes and tribal members, it is clear that FPBJ is integral to "cultural practices and beliefs that are (1) rooted in the history of a community, and (2) are important to maintaining the continuity of that community's traditional beliefs and practices" (Parker, 1993). FPBJ possesses great integrity of relationship and integrity of condition, and great value as a cultural resource.

3. Black-Tailed Prairie Dog Resource

3.1 Park Landscape

First Peoples Buffalo Jump State Park is almost entirely grassland that includes native and introduced species of grasses and forbs. The native grassland component consists of western wheatgrass, blue gama, and needle-and-thread grass. Other species present in abandoned agricultural fields include crested wheatgrass, alfalfa, and slender wheat grass. Cheatgrass, an introduced species, occurs throughout the area. Vegetation at the base of the cliffs is dominated by deciduous shrubs and great basin wild rye.

First Peoples Buffalo Jump State Park provides habitat for a variety of wildlife. Ungulates roam the grasslands, while the combination of cliffs and abundant prey provide excellent habitat for raptors to hunt and nest. Some years burrowing owls have been resident in the prairie dog colonies within or adjacent to the park. Mountain plovers have also been observed at the colonies (Hopkins, 2012). The combination of cliffs and prairie dog colonies also provide excellent rattlesnake habitat.

3.2 Prairie Dog Population Overview

The black-tailed prairie dog was once widely distributed throughout the Great Plains from southern Canada to northern Mexico and historically occurred in large colonies, some of which were up to 20-40 miles long in Montana (Knowles et al., 2002) and up to 250 miles long elsewhere (Bailey, 1905, 90). During the 1900s, prairie dog numbers declined drastically due to government-sponsored control programs, conversion of grassland habitat to croplands, and major plague outbreaks. Prairie dogs appear to be rebounding from a nadir that occurred at some time in the middle of the previous century: abundance of prairie dogs has increased seven-fold since 1961 (Hamilton, 2009, 63349).

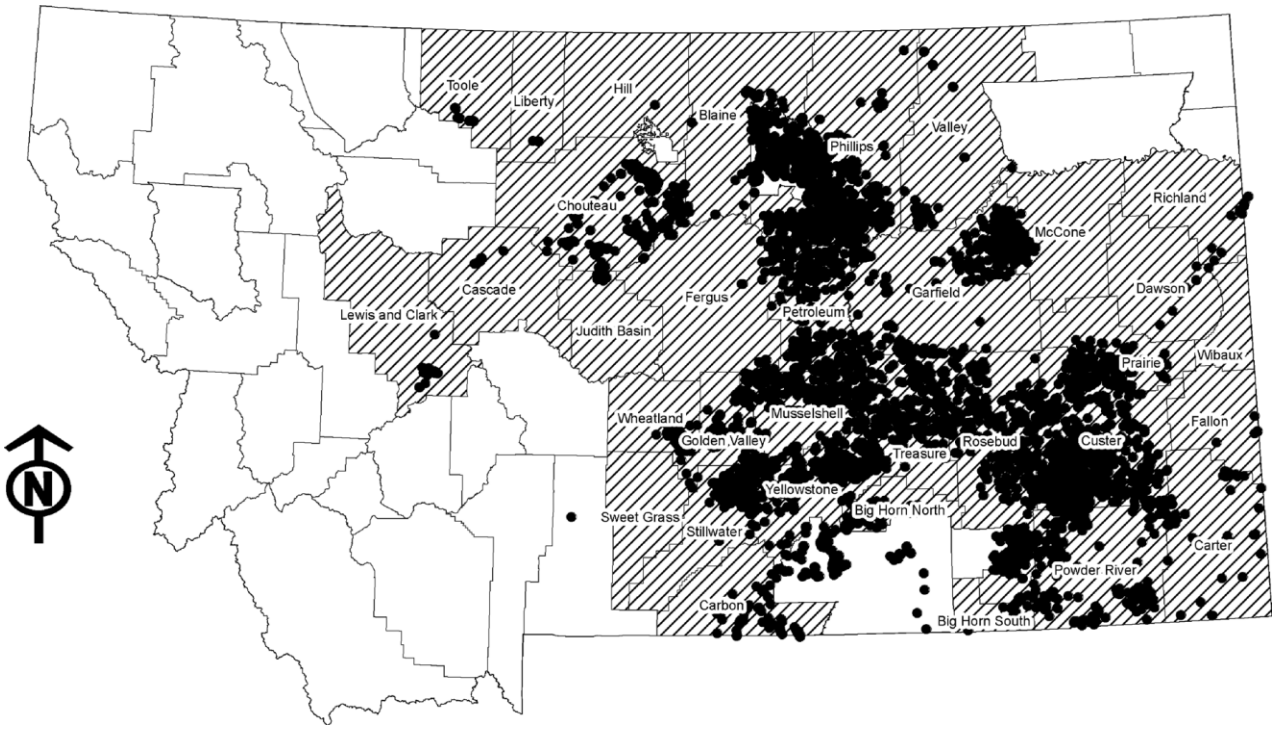
The subject of inter-agency management guidelines as early as 1988 due to its relationship with the black-footed ferret (Montana Prairie Dog Working Group, 2002), the black-tailed prairie dog was petitioned for federal listing as a threatened species in 1998 under the Endangered Species Act due to dwindling populations, the decline of large complexes, lack of regulatory protection, plague, and habitat loss. After several investigations and petitions, and listing as a candidate threatened species from 2000 to 2004, the U.S. Fish and Wildlife Service found in 2009 that the black-tailed prairie dog is not in danger of extinction now nor is it likely to become so in the foreseeable future throughout all or a significant portion of its range, and listing, therefore, is not warranted (Hamilton, 2009).[6] The black-tailed prairie dog is listed by the Montana Natural Heritage Program as a species of concern, a list that confers no legal protection, but highlights "native Montana animals that are considered to be 'at risk' due to declining population trends, threats to their habitats, and/or restricted distribution" (Montana Natural Heritage Program, 2016).

According to the Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group, 2002) and Rauscher (2013), black-tailed prairie dogs in Montana maintain a population distributed through roughly 90% of their known historical range

[6] If black-tailed prairie dog were to be listed at some point in the future, the management plan for FPBJ would be reviewed and amended as necessary to comply with the ESA with regard to the management of prairie dogs.

(Montana Prairie Dog Working Group, 2002). The goal of the Conservation Plan is to provide for management of prairie dog populations and habitats to ensure long-term viability of prairie dogs and associated species. The Conservation Plan called for active prairie dog colonies on 90,000 – 104,000 acres of land in the state (excluding Tribal lands) (Montana Prairie Dog Working Group, 2002, 16). A 2008 aerial survey of the state yielded an estimate of 191,000 acres of active prairie dog colonies (excluding Tribal lands), nearly doubling the Conservation Plan's objective and suggesting that the status of prairie dogs in Montana is more secure than previously thought.

FIGURE 6. RECORDS OF PRAIRIE DOG COLONY LOCATIONS IN MONTANA.



Counties (slashed) in Montana, USA, surveyed for black-tailed prairie dogs in 2008 and records of prairie dog colony locations (dots). Source: Rauscher et al. 2013.

3.3 Population Distribution Within the Park

Historical records cite the presence of prairie dogs along the upper Missouri River before European-American settlement of the area (Cooper, 1869). It is unknown whether prairie dogs were present at the FPBJ site when the buffalo jump was used in hunting. Aerial photos of FPBJ from 1937 and 1950 do not show any prairie dog towns. The FPBJ prairie dog complex was first mapped in 1996, when only one 60-acre colony existed.

Conservation agencies identify prairie dog colonies within seven kilometers (4.4 miles) of each other as part of the same complex, because this is roughly the upper distance that individuals disperse from home colonies (Montana Prairie Dog Working Group, 2002; Hoogland, 2006). Since its first quantification in 1996, the prairie dog colony at FPBJ has grown more than ten-fold into a complex that encompasses seven colonies within and immediately adjacent to the park (588 acres; see Figure

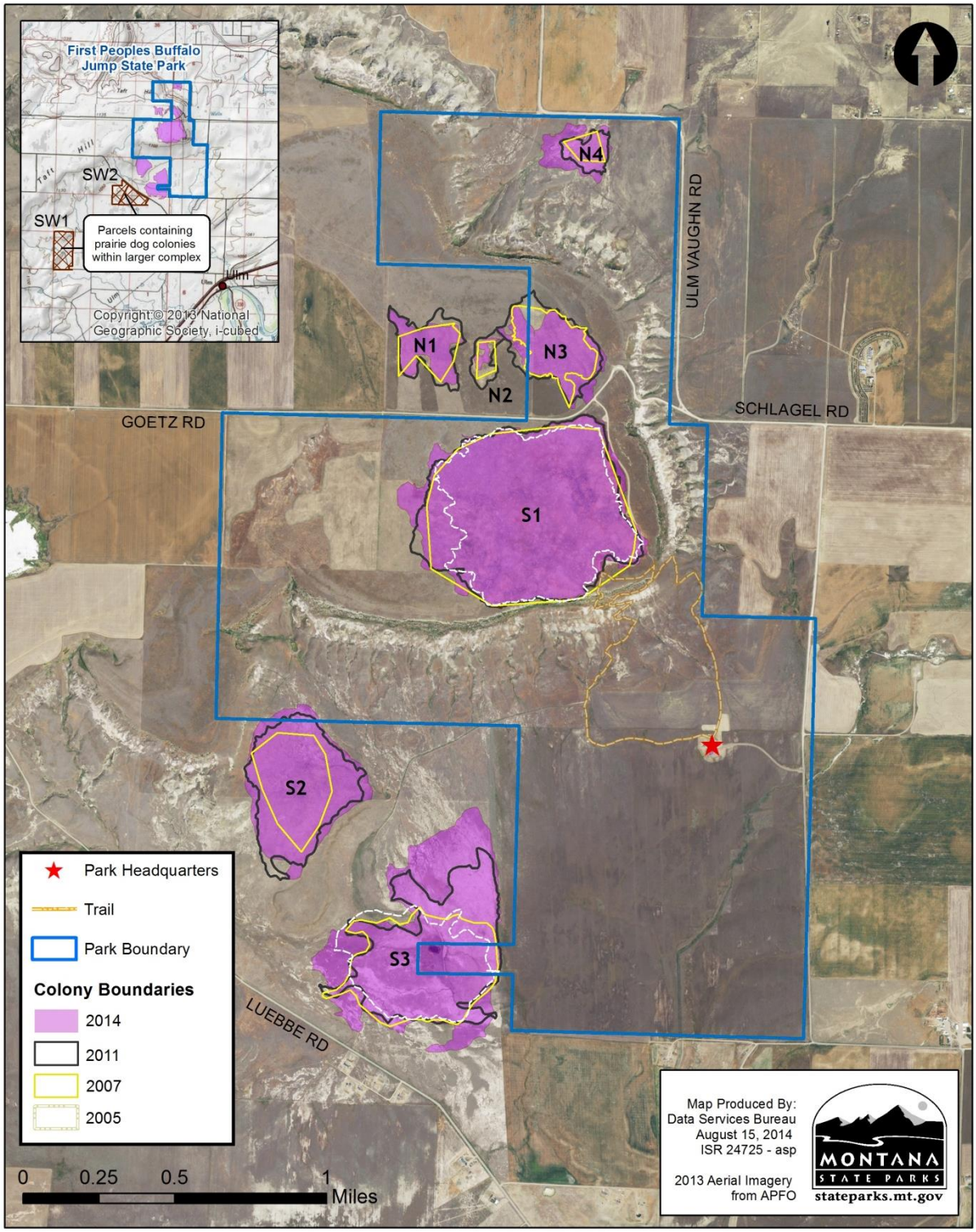
7)[7] and two colonies roughly 2.5 miles to the southwest of the park (SW1 and SW2) that occur on a mix of private and leased DNRC land. SW1 was estimated to be 127 acres in 2003 (Kellogg, 2016), and 541 acres in 2011, but current acreage estimates for the SW colonies are unavailable; MSP knows that SW1 was poisoned in 2015, and knows that prairie dogs currently occupy both SW1 and SW2. Figure 7 enumerates the change in prairie dog colony acreage since 1996; a dash indicates lack of data. Figure 8 shows acreage changes for the seven colonies within and immediately adjacent to the park since 2005.

FIGURE 7. FPBJ PRAIRIE DOG COMPLEX ACREAGE BY YEAR

Colony	1996	2005	2007	2011	2012	2014
N1	0	0	16	24		20
N2	0	0	4	8	67	2
N3	0	0	32	43		40
N4	0	0	5	10	10	19
S1	60	181	210	214	192	228
S2	0	0	43	80	85	93
S3	0	89	94	119	137	186
FPBJ + Adj. Subtotal	60	270	404	498	491	588
SW1	-	-	-	541	-	-
SW2	-	-	-	-	-	-
TOTAL	60	270	404	1039	491	588

[7] FWP does not have data on prairie dog population numbers. Because of the difficulty of counting prairie dogs, the extent of active colonies is generally used as a proxy to estimate species abundance (Biggins et al., 2006; Rauscher et al., 2013; Montana Prairie Dog Working Group, 2002).

FIGURE 8. PRAIRIE DOG DISTRIBUTION AT FIRST PEOPLES BUFFALO JUMP S.P., 2005 - 2014



The colonies in or immediately adjacent to the park include:

(S1): FPBJ's largest and original colony, at 228 acres, S1 is located on the bench above the south buffalo jump cliffs and extends onto DNRC land to the west. Most of this land was previously farmed. Remains of an old homestead are within the colony, and the colony overlaps with some of the most important heritage resources at the park. The western portion of the colony is about half a mile from private agricultural land. This colony occurs in the same area with important heritage resources.

(N1, N2, N3): These three colonies were originally mapped as three separate, incipient colonies, but functionally merged between 2005 and 2007. This colony, located on the bench above the north buffalo jump cliffs and separated from S1 by a county road, now encompasses 62 acres. The western portion of N1-N3 is within a couple hundred yards of DNRC land farmed for small grain crops. This colony, particularly N3, includes heritage resources such as the rock cairns that were part of drive lines established by Native Americans to run bison over the jump cliffs. Portions of the colony area were once cultivated to plant crested wheatgrass, but most of the colony's area is within areas of native vegetation.

(N4): This 19-acre colony is located between the Ulm-Vaughn Road and the north buffalo jump cliffs on the north side of the Park. The colony is on DNRC land that is administered as part of the Park through a perpetual easement. This colony started between 2005 and 2007 and is in a small area dominated by native vegetation. It is adjacent to privately owned agricultural land. A small Richardson's ground squirrel colony is located in the wheat field north of the Ulm-Vaughn Road prairie dog colony.

(S2): This 93-acre colony is located below the south buffalo jump cliffs primarily on DNRC land leased by the All Nations Pishkun Association. The extreme northern portion of the colony is in the Park, and appears to be expanding northward. This colony is on native vegetation, and the DNRC portion is grazed year-long by horses.

(S3): This 186-acre colony is below the south buffalo jump cliffs primarily on DNRC land leased by the All Nations Pishkun Association. A small portion of FPBJ cherry stems into DNRC land and this colony. The eastern boundary of the colony adjoins the southwestern Park boundary and extends a few yards inside the Park. The southern section (1 square mile) of the Park is planted with alfalfa, and the prairie dogs have not colonized this habitat. The southeastern corner of this colony is within a quarter-mile of private agricultural land south of the Park. Luebbe Road runs along the southwestern portion of the colony on the south side; an occupied subdivision parallels the road with homes a quarter-mile from the prairie dog colony. The All Nations Pishkun Association grazes a small group of horses on this land; the horses are fenced out of the portion of the colony in the Park. Remnant mounds in this area suggest that this site may have been an historical prairie dog colony, although there were none there in 1996.

SW1 and SW2 are on private and DNRC land roughly 2.5 miles southwest of FPBJ. The active acreage in the two colonies has not been estimated by MSP since SW1 was reviewed in 2011, at

which time it was 541 acres. MSP understands that SW1 was treated with Rozol in 2015. Prairie dogs persist at both colonies but their abundance is unknown.

3.4 Plague

Sylvatic plague is a bacterial disease introduced to North America and spread by fleas. Prairie dogs appear to have very limited immunity to the plague and in the 1980s and 1990s plague appeared to play a significant role in the decline of some Montana prairie dog complexes (Montana Prairie Dog Working Group, 2002, 40-42). Plague appears to have, through reduction in prairie dog populations, impacted populations of associated species such as burrowing owls and mountain plovers (Knowles, 2006).

To date, the sylvatic plague has not been documented at the First Peoples prairie dog complex, perhaps due to the relatively isolated geographic location of the complex. Isolated prairie dog colonies are important to maintaining statewide distribution of prairie dogs and distribution of species associated with prairie dogs (Montana Prairie Dog Working Group, 2002). Isolated prairie dog complexes may also be important to recovery from plague epizootics. Because they are less vulnerable to infection than more closely-spaced complexes, isolated prairie dog colonies may serve as source populations for re-colonization of areas depopulated by plague.

Humans can contract sylvatic plague from close exposure to infected animals via flea bites. While the likelihood of infection from prairie dogs is very, very small for the general public, the consequences of infection are potentially lethal. To reduce the risk of humans contracting plague, prairie dog colonies should be kept away from high visitor use areas (e.g. campgrounds, picnic areas, employee housing and work areas) to the extent possible.

3.5 Importance of the Prairie Dog Complex to Other Wildlife Species

The black-tailed prairie dog is an important component of the grassland ecosystem of the Great Plains. Prairie dogs strongly influence species composition and ecosystem health due to their function as a disturbance agent through soil and vegetation manipulation (Agnew et al. 1986; Kotliar et al 1999). Prairie dog tunneling loosens and aerates the soil, and alters vegetation species richness, structure, phenology, and biomass when compared to uncolonized mixed-grass prairie (Whicker and Detling 1988; Archer et al. 1987).

A number of species are wholly or partially dependent on prairie dog colonies as prey and/or for habitat. Species that benefit from the presence of prairie dogs include burrowing owls, mountain plovers, horned larks, ferruginous hawks, golden eagles, black-footed ferrets, badgers, prairie rattlesnakes, coyotes, and Great Plains toads. Due to the number of species that depend on prairie dogs to some extent, some biologists assert that black-tailed prairie dogs are both a keystone species (having significant, unique, and disproportionate effects on its ecosystem) and a foundation species (having significant and unique effects on its ecosystem due to abundance) (Kotliar et al., 2006).[8]

[8] But also see Witmer et al. (2006), who found relatively little use of prairie dog burrows by other animals, with the majority of such use by invertebrates such as crickets and beetles.

Black-footed ferrets are prairie dog obligates, unable to survive without them. Black-footed ferrets do not appear to occur at FPBJ and the FPBJ complex does not meet current criteria for ferret reintroduction (Knowles, 2012).

Some wildlife species that are associated with or dependent upon prairie dogs are threatened or appear to be in decline. The burrowing owl and mountain plover are not federally listed but their populations are in decline and are state-listed by FWP as species of special concern. Golden eagles, which are federally protected under the Bald and Golden Eagle Act, are sometimes observed soaring over the park's prairie dog colonies and a golden eagle nest is currently located on the south cliff face in the park.

4. Alternatives

To evaluate potential courses of action at FPBJ, MSP has identified three alternative potential management directions for detailed consideration:

- **Alternative A**: No Action – permit prairie dogs to flourish (or perish) without interference.
- **Alternative B**: Adaptive Management (Preferred Alternative) – remove prairie dogs where they have adverse impact on heritage resources.
- **Alternative C**: Removal – remove all prairie dogs from the park.

These three alternatives, and those considered but eliminated from further consideration, are explained below.

4.1 Alternatives Receiving Detailed Consideration

4.1.1 Alternative A – No Action

Currently prairie dogs at the park are not managed by FWP. The No Action Alternative would continue this policy. Under the No Action Alternative prairie dog populations at FPBJ would expand or contract without management interference. Currently the prairie dog population in the park is expanding, and is already encroaching upon and impacting heritage resources. The No Action Alternative would meet MSP's commitment to manage for native grasslands supporting native species. However, this alternative would not meet FPBJ's secondary objective to protect heritage resources from damage; would not achieve the primary management purpose of FPBJ; would not meet the Purpose and Need for this project; and would constitute nonfeasance.

4.1.2 Alternative B – Adaptive Management (Preferred Alternative)

Alternative B, the Adaptive Management Alternative, is MSP's preferred alternative. Under the Adaptive Management Alternative MSP would remove or reduce prairie dog populations where necessary to protect heritage resources. MSP would attempt to retain a healthy prairie dog population where they do not cause a significant adverse impact to heritage resources. MSP would monitor both prairie dogs and resource impacts in an attempt to learn how to best protect heritage resources while retaining prairie dogs.

MSP refers to this as the Adaptive Management Alternative because management would require a mix of control efforts, monitoring, learning, and new control efforts. Adaptive management treats management actions as experiments that have risk, yield data, and improve future decision making (Stankey et al., 2003). MSP seeks to learn how to retain prairie dog populations while protecting cultural resources.

Under the Adaptive Management Alternative MSP would divide First Peoples Buffalo Jump into two zones: the High Threat to Heritage Resources Zone and the Low Threat to Heritage Resources Zone (see Figure 9). In both zones MSP would manage prairie dogs to protect cultural, archeological, and heritage resources. The zones are differentiated, however, to identify the differing extent to which populations in the two zones are currently impacting known cultural, archeological, and heritage resources.

High Threat to Heritage Resources Zone. Within the High Threat to Heritage Resources Zone colonies S1 and N3 overlap to a great extent with significant cultural, archeological, and heritage resources. Prairie dogs in this colony are damaging drive lines and other artifacts that are essential to the purpose and integrity of the park. Given the high extent of congruence between the colony and cultural artifacts, MSP proposes to remove these colonies through trapping and translocation or lethal control. Due to the great geographical correspondence between the colonies and heritage resource locations, MSP does not believe that colony size reduction, barrier emplacement, or other steps short of colony removal would result in the immediate or long-term protection of critical heritage resources.

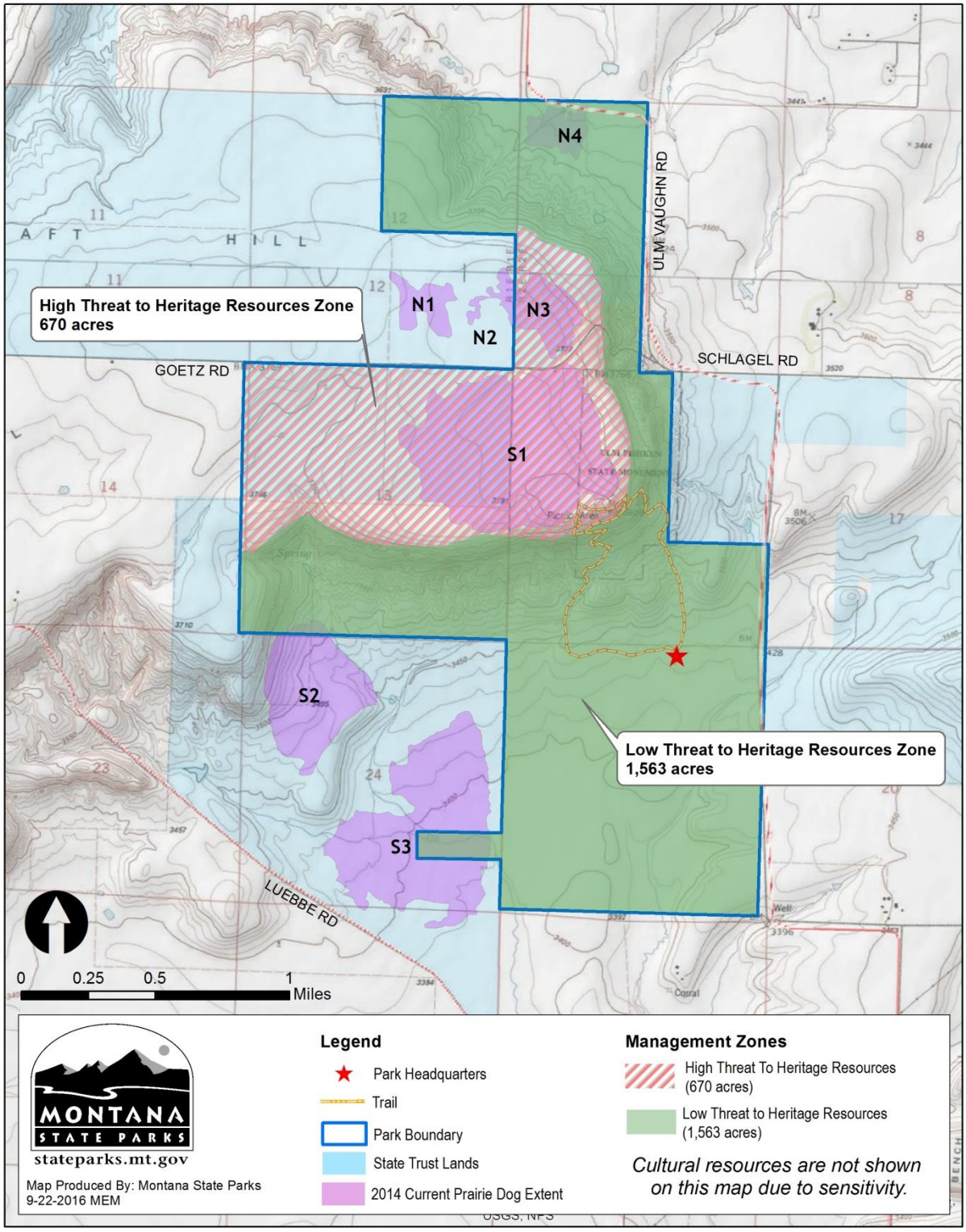
In the High Threat Zone MSP would determine and implement the best method or combination of methods of removal from S1 and N3. "Best" means the method or combination of control methods which best meets the site-specific goal (full removal, in this case) in consideration of other salient factors such as geography, cost, efficacy, timeline, and collateral effects. The potential methods of control are explored in **Section 4.3**.

Removing the S1 and N3 colonies from the High Threat Zone would eliminate about 45% of the active prairie dog acreage in and immediately adjacent to FPBJ. (SW1 and SW2 would be unaffected.) Particularly if prairie dog colonies N1 and N2 on nearby DNRC land persist, recolonization of S1 and N3 is likely, while other colonies could, in time, be established within or spread into the High Threat Zone. MSP would utilize the results of monitoring in combination with other salient factors to determine when it is necessary or desirable to take action to treat nascent colonization or recolonization in the High Threat Zone, and with which control methods. MSP would attempt to keep the prairie dog population in the High Threat Zone as close to zero as is practical given funding and other limitations and the inherent limits of the various control methods identified in **Section 3**.

Low Threat to Heritage Resources Zone. The Low Threat to Heritage Resources Zone includes all of First Peoples Buffalo Jump State Park not within the High Threat to Heritage Resources Zone. Within the Low Threat Zone MSP would manage prairie dogs to prevent damage to heritage resources. However, current knowledge of the location of heritage resources and prairie dog colonies suggests that contemporary impact to heritage resources is real but minor in extent, and less than inevitable. Accordingly, in this zone MSP would attempt to retain a viable prairie dog population while employing control methods as necessary to protect cultural resources.

Management in the Low Threat Zone would, in the short term, include some kind of action to control expansion or reduce extent at colony N4 where impacts are occurring. In the long term, management actions in this zone would depend on monitoring prairie dog impacts to heritage resources.

FIGURE 9. WORKING MAP FOR ALTERNATIVE B: ADAPTIVE MANGEMENT (PREFERRED)



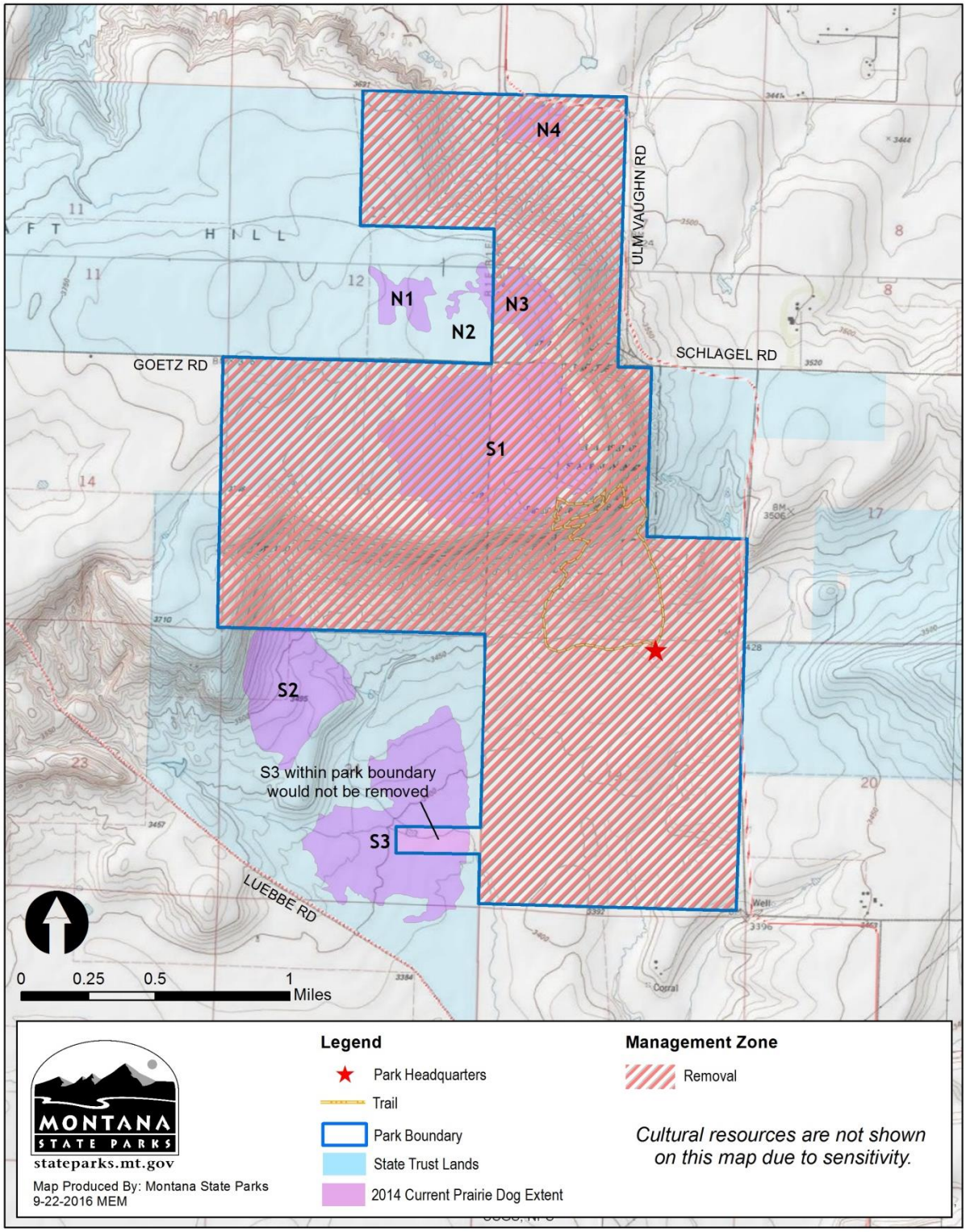
4.1.3 Alternative C – Removal

Under Alternative C, MSP would attempt to remove all prairie dogs within park boundaries and prevent recolonization. (Except in S3; see below). Under the Removal Alternative about half of the active burrow acreage in and immediately adjacent to FPBJ would be removed, leaving approximately 300 acres intact. (SW1 and SW2 would also remain untouched.) Alternative C assumes that the greatest possible prairie dog population reductions are the most likely to prevent recolonization of colonies/burrows that are impacting heritage resources. Alternative C achieves the primary objective of the park; however, it does not successfully address secondary objectives, such as maintaining the native ecosystem at the park to the extent possible.

Under the Removal Alternative MSP would determine and implement the best method or combination of methods to remove all prairie dogs from the park. If prairie dog colonies on nearby DNRC land persist, recolonization of First Peoples is likely. MSP would utilize the results of monitoring in combination with other salient factors to determine when it is necessary or desirable to take action to repeatedly address prairie dogs and with which control methods. MSP would attempt to keep the prairie dog population in the park as close to zero as is practical given funding and other limitations and the inherent limits of the various methods of control identified in **Section 4.3**.

Under the Removal Alternative MSP would likely take no action to control prairie dogs in the park's portion of colony S3. The nature of MSP's "cherry stem" into DNRC land there makes effective removal of prairie dogs challenging, and recolonization likely immediate. As under the Adaptive Management Alternative, MSP would consider independent action at S3 should that colony threaten heritage resources in such a manner that removal in the cherry stem could slow any expansion into the park that threatens heritage resources.

FIGURE 10. WORKING MAP FOR ALTERNATIVE C: REMOVAL



4.2 Alternatives Considered but Eliminated from Further Analysis

MSP considered but eliminated from further analysis three alternatives.

1. MSP considered designating the entire park an Adaptive Management Zone. However, MSP determined that the ongoing damage to heritage resources atop the cliff requires immediate and continuing removal of prairie dogs. Colonies S1 and N3, in the High Threat to Cultural Resources Zone, are simply too intermingled with heritage resources for any action short of removal to succeed in protecting the heritage resources of the park.
2. MSP considered managing prairie dog populations to restrict them to a geographic area that precludes impact to heritage resources, likely pegged to distribution in a baseline year. MSP determined that this alternative would not grant MSP the necessary flexibility to incorporate new data on the location of heritage resources as it becomes available.
3. MSP considered policies of less than full removal for colonies in the High Threat Zone. The largely overlapping occurrence of heritage resources and prairie dogs, in addition to the impacts of barriers themselves (further discussed in Section 5.2) makes barriers an impractical solution. The reproductive capability of prairie dogs, in which success increases after mortality events (particularly when empty burrows are readily available) suggested that attempts to reduce—but not remove—prairie dogs in the High Threat Zone would be Sisyphusian.

4.3 Common to Action Alternatives: Potential Methods of Prairie Dog Control

Under the action alternatives (Adaptive Management and Removal) MSP would utilize a suite of tools for removing, diminishing, or limiting prairie dog populations. MSP would make context-specific decisions regarding the appropriate means to remove or reduce populations, basing decisions on efficacy, cost, harm to secondary species, and other potential ancillary effects of poisons, fumigants, traps, and translocation. Each method has different costs, strengths, and weaknesses, and most are best or only utilized during certain seasons. Because no method of control removes 100% of prairie dogs in a single treatment; because some are better for large-scale reductions and some for small; and because some cannot be applied multiple times,[9] MSP will necessarily utilize complementary tools to achieve removal. The tools that MSP may utilize as necessary and appropriate include:

- Live trapping and translocation;
- Physical and natural barriers;
- Raptor perches;
- Toxicants including zinc phosphide and anti-coagulants;
- Lethal trapping;
- Aluminum phosphide.

For all control methods MSP will survey prior to treatment to ensure that burrows used by non-target species such as burrowing owls are not affected, and that black-footed ferrets are not present.

[9] For example, prairie dogs that have received sub-lethal doses of zinc phosphide will subsequently avoid treated grain (Knowles, 2012, 26).

As practical, MSP will consult with the Montana Department of Agriculture prior to any control efforts.

4.3.1 Cage Trapping and Translocation

When an area in FPBJ requires control of prairie dogs, MSP will explore the potential for translocation. Prairie dogs can be live-trapped using wire mesh cages. Live trapping can effectively reduce colony population, but it is extremely time-intensive. Existing FPBJ staff do not have trapping expertise; training with or assistance from partner agencies or the appointment of additional personnel would be necessary to trap a significant number of prairie dogs.

Nistler (2009, 44-51) provides a review of translocation protocols, including timing, coterie composition, plague quarantine, vegetation management, and acclimation cages. Successful translocation of prairie dogs requires a site with suitable vegetation and topography. It entails site preparation and a soft release technique (holding pens and artificial burrows) so prairie dogs do not disperse from the release area in large numbers; if they disperse they generally do not survive. Prairie dogs can be released directly into abandoned prairie dog colonies, but if the cause of abandonment was plague, recurrence of plague can occur among the reintroduced population.

Given that both trapping and translocation are time intensive, the two together present a formidable barrier to implementation at FPBJ. The financial and personnel costs of translocation indicate that translocation is only a viable option in collaboration with a well-funded third party. It may also be challenging finding recipient locations: agencies or individuals who do not currently host prairie dogs but desire to and have appropriate habitat are rare. MSP will seek potential partner agencies that a) desire live prairie dogs, and b) would assume the responsibility for introduction.

MSP will explore cage trapping prairie dogs and then donating them to a federal black-footed ferret recovery program to support reintroduction of this federally endangered species. However, trapping and transportation of prairie dogs for this purpose would be expensive and time consuming.

4.3.2 Physical and Natural Barriers

MSP considers the use of physical and natural barriers a viable but limited-potential management tool. In this management strategy visual and/or physical barriers could be established or erected to limit colony expansion in particular directions. Fencing or other mechanical barriers (e.g., hay bales, slash, silt fence) could be erected to limit prairie dog dispersal. Vegetation could also be used to attempt to influence where prairie dog colonies are located on the landscape by allowing growth of tall vegetation with a dense layer of litter.

Barriers' efficacy is in inverse relationship to their affordability and acceptability in other dimensions. An effective barrier would require both underground infrastructure and a large physical and visual footprint. For example, "Exclusion of prairie dogs is rarely practical, although they may be discouraged by tight-mesh, heavy-gauge, galvanized wire, 5 feet (1.5 m) wide with 2 feet (60 cm) buried in the ground and 3 feet (90 cm) remaining aboveground. A slanting overhang at the top increases the effectiveness of the fence" (Hygnstrom and Virchow, 1994). Such a barrier would be costly, would risk harm to the very heritage resources MSP seeks to protect, and would

detract from the scenic and cultural resources of the park. MSP will not utilize emplaced, infrastructural barriers.

Less intrusive barriers, such as vegetative barriers, have not, thus far, proven effective against prairie dogs in the long term (Hygnstrom et al., 2011, 4; Nistler, 2009, 31-2; Andelt, 2006, 129-131). Hypothetically, snow fencing could be placed along existing fence lines to create a slight physical barrier and to drift snow to provide additional moisture for vegetative growth. This technique entails significant maintenance costs, impairs scenic and cultural resources, and, again, thus far has not proven particularly effective. However, MSP will continue to monitor research into vegetative or other low-cost, low-profile barriers and consider experimentation with methods that seem promising.

4.3.3 Installation of Raptor Perches

MSP considers installation of raptor perches a viable (but low-efficacy) prairie dog management technique. Installation of raptor perches enhances the ability of raptors to view and hunt for prey. Golden eagles and three other endemic raptor species (ferruginous hawks, prairie falcons, red-tailed hawks) regularly prey on prairie dogs. In 2006, the park installed three raptor perches (6-8 feet high) in colony S1; the perches seemed ineffective and were later removed. Experts recommend poles 23 to 30 feet high—essentially telephone pole height (Vantassel, Undated).

Natural predation—even with encouragement—is not likely to materially affect a robust prairie dog population such as exists at the park. In part, this is due to prairie dog reproductive capacity, but also, in part, to the limits of raptor predation. For example, the presence of golden eagles may discourage use of the park by other raptors. Additionally, because raptor species are territorial, more than one or two nesting pairs of each species preying on the park's prairie dog population is unlikely. Finally, raptors may reduce the population of bull snakes and rattlesnakes that prey on prairie dogs, offsetting any increased predation. Although raptor perches will not remove prairie dog populations from places they threaten heritage resources, MSP believes they are worth consideration as part of the suite of tools used to limit prairie dog population growth—they are likely low efficacy, but also low cost. Impact on most resources is minimal, though they may be visually intrusive.

4.3.4 Lethal Control

MSP will include three types of lethal control in its suite of tools: toxicants; aluminum phosphide; and lethal trapping.

The most cost-effective way to reduce or remove prairie dog colonies is generally through the use of toxicants (Nistler, 2009). Two main types of toxicants are U.S. EPA-approved for use in Montana: zinc phosphide and anti-coagulants. Toxicants would be utilized consistent with U.S. Environmental Protection Agency (EPA) and label restrictions; in compliance with applicator licensing regulations; in compliance with USFWS restrictions; and in consultation with the Montana Department of Agriculture (as practical).

Zinc phosphide is delivered (after pre-baiting) via treated grain scattered outside burrows, and can achieve a 90% reduction in population. Zinc phosphide poses little secondary hazard to scavengers,

but can harm non-target species. To minimize secondary impacts MSP will collect treated grain when uptake is judged complete.

Anti-coagulants are delivered via treated grain inserted in burrows, and has an efficacy roughly comparable to zinc phosphide (Vantassel, Undated). Anti-coagulants pose little threat to non-target species, but consumption of killed prairie dogs can deliver secondary toxicity to predators/scavengers (Knowles, 2012). To minimize secondary impacts, MSP would search treated areas daily, collecting carcasses. However, some secondary impacts may still occur (Knowles, 2012).

MSP considers aluminum phosphide (AP) a potential tool for use at First Peoples Buffalo Jump. AP is deposited in burrows, which are then temporarily blocked; AP tablets react with moisture to give off phosphine gas. Fumigants have the potential, with repeated application, to achieve 100% mortality. Fumigants have a high non-target impact: they kill any vertebrate organism in the treated burrows. Accordingly, MSP would carefully survey for burrowing owls and other species of concern prior to any application (Hygnstrom et al., 2011). Aluminum phosphide would be used in compliance with all label and regulatory requirements and in consultation with the Montana Department of Agriculture (as practical).

MSP considers lethal trapping a viable management tool at First Peoples Buffalo Jump. MSP would utilize either leg-hold or wire mesh cages to capture prairie dogs, then euthanize them. Alternatively, Conibear traps could be set at burrow openings to kill prairie dogs upon emergence. According to the Montana Department of Agriculture, "trapping prairie dogs is very labor intensive and impractical for large acreages. However, leg-hold traps or body traps such as the Conibear could be used to catch prairie dogs on small areas" (Montana Department of Agriculture, Revised 2014). Trapping could be used to address an already-reduced colony population targeted for removal or to reduce prairie dog population in a geographic subset of a colony.

When live-trapped, black-tailed prairie dogs would be suffocated by carbon dioxide gas (CO_2) in a controlled chamber. Extensive documentation of the effectiveness and guidelines for use of CO_2 to kill animals has been developed by the American Veterinary Medical Association (AVMA) and Humane Society of the United States (HSUS), and wildlife managers have ranked carbon dioxide the best available field treatment (Julien et al., 2010). The lethal treatment occurs either on-site or at an off-site facility, depending on the contractor's capabilities. It is possible that the black-footed ferret recovery program or a raptor rehabilitation program would welcome prairie dog carcasses.

4.3.5 Methods Considered but Not Meriting Detailed Analysis

MSP reviewed a number of other methods sometimes used to control prairie dogs, but determined that they did not merit further analysis. Those methods included:

- Propane/oxygen exploders (which could potentially damage cultural resources);
- Gas cartridges (a fire hazard);
- Recreational shooting (unsafe);
- Controlled shooting (unsafe);
- Chemosterilants (largely untested, potential non-target impacts)
- Pressurized carbon monoxide treatment (not adequately field tested).

4.3.6 Summary and Proposed Plan With Regard to Methods of Control

Where control of prairie dog populations is needed MSP will consider the methods discussed in depth above in the context of cost, efficacy, desired outcome, and other factors. MSP will likely utilize a combination of methods to achieve the various site-specific goals of full removal, temporary population reductions, or geographic control. While MSP prefers non-lethal control methods, it is important to recognize that toxicants and aluminum phosphide are the most effective and the least expensive methods of removal available to the agency, while translocation is the most expensive and least effective. One author, William Andelt of Colorado State University, bluntly separates potential control methods into "Methods That Do Work Well for Managing Prairie Dogs" and "Methods That Do Not Work Well for Managing Prairie Dogs or Are Too Expensive" (Andelt, 2006). In the former category Andelt includes limitation of grazing, recreational shooting, zinc phosphide, and fumigants (such as AP). In the latter category Andelt includes habitat alteration, predator odors, translocation, contraceptive agents, gas exploding devices, and visual barriers. MSP will likely need to utilize lethal control methods to adequately protect heritage resources.

Prairie dogs can quickly recolonize empty burrows. Accordingly, where prairie dogs have been removed MSP may fill burrow entrances with pea gravel or other inorganic substances to retard recolonization. MSP will survey burrows to ensure that any in active use by other species are not filled.

5. Affected Environment and Environment Consequences

This section describes the physical, biological, and human resources of the environment and how they may be affected by the alternatives presented in the previous section. Affected environment and environmental consequences have been combined into one section; detailed discussion of heritage resources at FPBJ was included in **Section 2**, while detailed discussion of prairie dogs comprised **Section 3**.

5.1 Heritage Resources

Effects of Alternative A: No Action
As identified **in Section 1.1** and further discussed below, prairie dog burrowing is having a significant adverse impact on cultural, archeological, and heritage resources at FPBJ. The primary objective of the park is to protect heritage resources; the No Action Alternative fails to achieve that objective.

Prairie dog burrows occur in the same area with significant archeological and heritage features at the park. Individual prairie dog burrows can go to depths of three to 15 feet, and lengths of 13 to 109 feet (Sheets et al., 1971; Hoogland, 1995, 26-36). Prairie dog burrow entrance mounds are generally one to two feet high (Sheets et al., 1971; Montana Department of Agriculture, Revised 2014) and typically occupy roughly 6 percent of the surface area in a colony (Detling, 2006).

Not surprisingly, "rodent activity is a widely recognized and much-lamented component of post-depositional disturbance" (Bocek, 1986) at archeological sites. Burrowing disturbs artifacts that lie below the surface of the ground and can significantly damage or destroy archaeological features (Scott, 2015). Prairie dogs also move artifacts and other material above ground and below, thereby potentially damaging artifacts; altering surface features which are critical to "reading" historical use of the site; and, by stratifying buried artifacts based on size (small things displaced up, larger things buried), damaging our ability to understand the temporal relationship between artifacts (Scott, 2015)(Balek, 2002; Bocek, 1986; Erlandson, 1984; Johnson, 1989).

Concurring with MSP concerns regarding burrowing impacts at FPBJ, the Montana State Historic Preservation Office has expressed concern over the disturbance from prairie dog colony activity at the park:

> *While some effects such as transport and mislocation of carbon 14 sample material may be unlikely at First People's - were that material found to be present it would be a critically important loss. More obvious impacts are krotovinas (sediment filled burrows) resulting in churning and translocation of soil matrix in extensive underground cavities and tunnels. Lithic scatters may "disappear." Partial to complete disturbance of the soil matrix can occur. Also obvious is the lateral and vertical movement of even large stones in rock alignments, stone rings and other surface features. Rock cairns collapse. [...] The visibility of the surface features at First People's is a critical and highly invocative value to public interpretation and broader Native American community values. This visibility is in the process of*

being severely diminished. We concur that the prairie dog activity is extremely detrimental and should be vigorously addressed.

Documenting below-ground disturbance is all but impossible, but below are photos of some of the documented disturbance caused by prairie dogs near archeological and cultural resources on top of the Jump. Photos were taken in April 2016 as part of ongoing monitoring.

FIGURE 11. PHOTOS OF PRAIRIE DOG DISTURBANCE NEAR DRIVE LINES

MSP believes that prairie dogs are damaging heritage resources at the park in two ways. First, cultural resources, as noted previously, are those that contribute to the site's cohesiveness and functionality in facilitating the continuance of Native American traditional beliefs and practices. Given that "integrity is the ability of a property to convey its historical associations or attributes," colonies S1 and N3, among the drivelines, by obscuring or damaging driveline cairns undermine the cohesiveness and its historical functionality, reducing integrity of condition and relationship, and thus damaging cultural resources.

Second, archeological resources are both inherently valuable scientific and heritage resources, and cultural resources. Tools and other artifacts provide a tangible, intuitive bridge to a thousands of years-old history of use. When prairie dogs damage ancient tools or scatter temporally-related items, they both damage archeological resources and adversely impact Native Americans' opportunity to maintain continuity with long-term cultural practices—again, they impact integrity of condition and integrity of relationship. Further, impacts to archeological resources may compromise our ability to learn from these important sites.

Prairie dogs are causing significant adverse impacts to heritage resources at FPBJ, and diminishing the integrity and heritage value of FPBJ. Under the No Action Alternative these impacts would continue. Indeed, the prairie dog complex has clearly trended toward expansion, so barring plague or some other catastrophic depopulation event, electing the No Action Alternative would mean increased impacts to heritage resources at First Peoples Buffalo Jump, diminishing its inherent integrity, diminishing its value as a source of scientific and historical knowledge, reducing its value as an educational tool, and reducing its cultural valence.

Because northern Native American cultures typically built with and utilized relatively ephemeral materials; because their histories were generally oral; and because of European-American treatment of Native Americans and their cultures, physical artifacts and structures that help preserve and explain their Native American cultures are relatively rare. First Peoples Buffalo Jump provides an unparalleled opportunity to protect a site with both contemporary cultural value and physical artifacts that help preserve and explain current and historical Native American cultures. Failure to protect the heritage value of this site contributes to our collective ignorance of Native American culture and thereby diminishes both our nation as a whole and Native American cultures specifically.

Effects of Alternative B: Adaptive Management Alternative (Proposed Action)
The Adaptive Management Alternative would protect heritage resources at FPBJ from significant adverse impacts by prairie dogs. Fully removing prairie dogs from the High Threat to Cultural Resources Zone (colonies S1 and N3) will eliminate the greatest impact to the integrity of cultural, archeological, and heritage resources. Within the Adaptive Management Zone, MSP will manage prairie dogs when and where they impact heritage resources. For example, while colony N4 currently infringes on heritage resources to a minor extent, MSP believes that management of that colony (short of total removal) can reduce such impacts to negligibility. No policy short of full removal can ensure that prairie dogs have zero impact on heritage resources, but the Adaptive Management Alternative should reduce prairie dog impacts to the point that they are not significantly adverse.

As identified in **Section 4.3**, MSP will use a suite of site- and context-appropriate tools to manage prairie dogs in both zones. Management strategies such as exploders, incendiaries, and buried fencing that could adversely impact heritage resources will not be used. The remaining management tools will remove prairie dogs without significant impacts to their physical environment, and will, therefore, not impact heritage resources.

Preservation of the heritage resources at FPBJ would contribute to a better understanding of pre-contact Native American culture, and broader education in the same regard.

Effects of Alternative C: Removal Alternative
Removal of the prairie dog colonies at FPBJ would protect the park's heritage resources. Even with recolonization, MSP could keep prairie dog population (and digging) at close to zero.

Preservation of the heritage resources at FPBJ would contribute to a deeper understanding of pre-contact Native American culture, broader education in the same regard, and support for the continuation of Native American cultural ways.

5.2 Black-Tailed Prairie Dogs

The current condition of black-tailed prairie dogs at First Peoples State Park, in Montana and nationally, is discussed at length in **Section 3**. In summary, the black-tailed prairie dog is considered both a sensitive species and a vertebrate pest in Montana. It is neither threatened nor endangered, and currently inhabits more than 190,000 acres in Montana (Rauscher et al., 2013). MSP here considers impacts at the scale of the FPBJ complex and state wide.

Effects of Alternative A: No Action
The No Action Alternative would permit the prairie dog population at FPBJ to expand or contract without direct MSP intervention. The current trend at the park is toward increases in geographic spread and apparent abundance. No Action increases the likelihood that the colony will continue to expand both within the borders of FPBJ and without.

Effects of Alternative B: Adaptive Management Alternative (Proposed Action)
The Adaptive Management Alternative will eliminate about half of the prairie dog population within and immediately adjacent to First Peoples Buffalo Jump. Removing the S1 and N3 colonies from the High Threat to Heritage Resources Zone would eliminate about 95% of the active burrows within the park boundary (all but about 20 acres),[10] but leave intact colonies on DNRC land and on private land (including the two SW colonies of undetermined current acreage). Under this alternative approximately 54 percent of the active prairie dog acreage in or immediately adjacent to the park would remain intact. Control as needed at N4 (and potentially S2 or other colonies in the future) could have an additional but minor effect.

MSP considered impacts to black-tailed prairie dogs state-wide and at the FPBJ complex. MSP has determined that the proposed action will not have significant adverse impacts on the prairie dog population at either scale. Given that prairie dogs have more than 190,000 acres of active burrow acreage in Montana, the loss of 266 acres represents the loss of about one one-thousandth of the current range in Montana. MSP judges this impact insignificant in the context of the state population.

The FPBJ complex will persist on more than 300 acres—more than five times the acreage it covered in 1996 and more than enough to support a robust complex. Given, additionally, that prairie dogs are capable of quick population rebounds after mortality events (Nistler, 2009), MSP believes that the black-tailed prairie dog will persist and thrive in the complex. Accordingly, MSP has determined that control of prairie dogs per the proposed Prairie Dog Management Plan, including complete removal of prairie dogs from the High Threat Zone, will not have a significant adverse impact on prairie dogs at the FPBJ complex.

[10] The acreage estimate is approximate, based on the relevant colony size rather than the park/DNRC boundary.

Cumulative impacts relative to the proposed action are also likely to be nonsignificant. FPBJ is too small, in itself, to affect the direction of state-wide species success, which, in any event, appears to have trended up since its low point in the 1960s.

At the complex scale, potential vectors for an adverse cumulative impact are plague and DNRC (or private) action to remove prairie dogs within the complex. While a plague event could happen at the FPBJ complex, it is difficult to estimate the likelihood of such an epizootic at a relatively isolated colony; further, it is not clear whether or to what extent having a larger population (i.e., taking no action) would increase chances of complex survival or recovery. In short, plague is possible, but MSP does not believe that this possibility can drive cumulative impacts analysis.

With regard to other parties' actions, about half of the portion of the FPBJ prairie dog complex within and immediately adjacent to the park occurs on DNRC land, while SW1 and SW2 occur on DNRC and private land, respectively. DNRC leaseholders are generally permitted, by the terms of their leases, to control prairie dogs at their own discretion (Chappell, 2016). MSP does not have any knowledge of the likelihood that local landowners and leaseholders will control prairie dogs on their lands. However, in considering cumulative effects, MSP judges leaseholder action to control prairie dogs on the 22 acres of N1 and N2 relatively likely, due to the potential for complementary efforts at local removal. Complete removal of the N1 and N2 colonies (as well as any portion of N3 that occurs on DNRC land) would leave approximately 50 percent of the current active prairie dog acreage in or immediately adjacent to the park (just under 300 acres) untouched. MSP believes that cumulative impacts from potential leaseholder control efforts at N1 and N2 would be negligible.

MSP judges leaseholder action to control prairie dogs at S2 and S3 unlikely and unlikely to be successful if undertaken because (a) such efforts have not previously been undertaken (and MSP management of prairie dogs in this section of the park is unlikely to change), and (b) such actions would probably be ineffective given prairie dog persistence on the MSP-owned portion of S3. Accordingly, leaseholder treatment of S2 and/or S3 is unlikely to contribute to cumulative impacts under this alternative.

Effects of Alternative C: Removal Alternative

Under the Removal Alternative roughly half of the active burrow acreage at the FPBJ complex would be removed, leaving approximately 300 acres intact (as well as SW1 and SW2). Removal across the park would include only approximately 20 additional acres of colony, as compared to Alternative B. As discussed for the Adaptive Management Alternative, MSP has determined that this will not have a significant adverse effect on the black-tailed prairie dog either state-wide or in the FPBJ complex.

At the complex scale, potential vectors for an adverse cumulative impact are plague and DNRC (or private) action to remove prairie dogs within the complex. While a plague event could happen at the FPBJ complex, it is difficult to estimate the likelihood of such an epizootic at a relatively isolated colony; further, it is not clear whether or to what extent having a larger population (i.e., taking no action) would increase chances of complex survival or recovery. In short, plague is possible, but MSP does not believe that this possibility can drive cumulative impacts analysis.

With regard to other parties' actions, about half of the portion of the FPBJ prairie dog complex within and immediately adjacent to the park occurs on DNRC land, while SW1 and SW2 occur on DNRC and private land, respectively. MSP judges it relatively likely that the leaseholder on whose lease N1, N2, S2, and S3 occur would implement prairie dog control efforts if MSP attempted to remove all prairie dogs at FPBJ. In this case, it is possible that the entire portion of the FPBJ prairie dog complex within and immediately adjacent to FPBJ (i.e., all but SW1 and SW2) would be eliminated. In this case, cumulative impacts to the complex would potentially be significant. Accordingly, were MSP to select this alternative additional investigation of potential leaseholder actions would be required to determine whether an environmental impact statement (EIS) is necessary.

5.3 Other Wildlife

Prairie dogs serve as a foundation and/or keystone species that supports a wide range of wildlife species either as prey or via ecosystem engineering. The obligate black-footed ferret does not appear to occur at FPBJ, but some sensitive species that benefit from prairie dog towns do, including mountain plover, burrowing owls, and golden eagles (see **Section 3.5**).

Effects of Alternative A: No Action
Under the No Action Alternative prairie dogs at FPBJ will continue to contribute to the success of species closely associated and/or dependent upon prairie dogs and to diversity in the local landscape.

Effects of Alternative B: Adaptive Management (Proposed Action)
The Adaptive Management Alternative would have minor adverse effects on prairie dog-dependent species. MSP will survey burrows for other occupants to limit potential impacts to non-target species, and MSP will follow all label and Montana Department of Agriculture recommendations for reducing non-target attrition, e.g., daily survey and removal of carcasses. MSP will mitigate any potential harms to the greatest extent practical.

Indirectly, the reduction in prey and of prairie dog-modified habitat would provide less desirable habitat for plover, burrowing owls, ferruginous hawks, and golden eagles. However, more than half of the FPBJ prairie dog complex will persist, suggesting that little impact to these species can be anticipated. Further, these species all range widely over the western United States, and none will be materially affected by a reduction of one one-thousandth of Montana's active prairie dog acreage. MSP believes the impact on other species will be adverse, but very, very minor.

Effects of Alternative C: Removal
The Removal Alternative would have minor adverse effects on prairie dog-dependent species. MSP will survey burrows for other occupants to limit potential impacts to non-target species, and MSP will follow all label and Montana Department of Agriculture recommendations for reducing non-target attrition, e.g., daily survey and removal of carcasses. The vectors for and potential impact of control methods on non-target wildlife varies; MSP will mitigate any potential harms to the greatest extent practical.

Indirectly, the reduction in prey and of prairie dog-modified habitat would provide a less desirable habitat for plover, burrowing owls, ferruginous hawks, and golden eagles. However, the majority of the prairie dog FPBJ complex will persist. Further, these species all range widely over the western United States, and none will be materially affected by a reduction of one one-thousandth of Montana's active prairie dog acreage. MSP believes the impact on other species will be adverse, but not significant.

5.4 Vegetation

First Peoples Buffalo Jump State Park is almost entirely grassland that includes native and introduced species of grasses and forbs. The native grassland component consists of western wheatgrass, blue gama, and needle-and-thread grass. Other species present in abandoned agricultural fields include crested wheatgrass, alfalfa, and slender wheat grass. Cheatgrass, an introduced species, occurs throughout the area. Vegetation at the base of the cliffs is distinctively different and is dominated by deciduous shrubs and great basin wild rye.

Management actions to remove or reduce prairie dog populations will not have any direct impacts on vegetation. However, black-tailed prairie dogs modify the vegetation in their colonies by disturbing the soil, selectively grazing forage plants, and clipping tall vegetation. Accordingly, population reduction or removal will have minor impacts on vegetation height, and possibly on species composition, but nothing beyond the normal range of variation.

Effects of Alternative A: No Action
Implementation of the No Action Alternative will generally retain park vegetation in the condition and composition as it currently exists. Continued expansion of prairie dog colonies may have minor impacts on vegetation height and species composition.

Effects of Alternative B: Adaptive Management (Proposed Action)
The primary, minor impact would be an increase in vegetative cover and height on the approximately 265 acres where black-tailed prairie dogs would be removed. Areas from which black-tailed prairie dogs are removed would have greater vegetative cover, and over time, plant species composition may change slightly away from grasses and toward forbs and dwarf shrubs (Detling, 2006).

Effects of Alternative C: Removal
The primary, minor impact would be an increase in vegetative cover and height on the approximately 285 acres where black-tailed prairie dogs would be removed. Areas from which black-tailed prairie dogs are removed would have greater vegetative cover, and over time, plant species composition may change slightly away from grasses and toward forbs and dwarf shrubs (Detling, 2006).

5.5 Human Population

5.5.1 Human Health

No significant impact on human health is expected under any of the considered alternatives. The extremely low likelihood of prairie dog to human plague transmission (should plague ever occur at

FPBJ) suggests that No Action is unlikely threaten human health (as are the action alternatives in this regard). Equally, MSP will administer any prairie dog control agents consistent with labeling and regulation in a manner that is protective of both applicators and the general public. No impact is expected.

5.5.2 Noise and Electrical Effects

None of the alternatives identified in this Management Plan or assessment would result in any noise or electrical effects on the human environment.

5.5.3 Regulatory Impacts

None of the alternatives identified in this Management Plan or assessment regulates the use of private tangible personal property or real property.

5.5.4 Impacts on Neighbors

Some private landowners may be concerned about prairie dogs dispersing from the park to private lands and affecting either farming or ranching. Prairie dog burrows can affect mechanical treatment of fields; however, many fields near the park are already occupied by Richardson's ground squirrel colonies, which have similar effects. There is persistent discussion around the extent to which prairie dogs affect grazing productivity—they appear to reduce total biomass while increasing nutritive value (Detling, 2006). Regardless, prairie dogs are classified by the state as a pest, and are disliked by many private landowners. Consistent with MSP's good neighbor policy (**Section 1.5.6**), MSP will monitor potential prairie dog impacts on neighbors under all alternatives.

It is possible that the No Action Alternative would slightly increase dispersal of prairie dogs from DNRC and FPBJ land to nearby private land, as compared with the action alternatives. Removal or prairie dogs may make dispersal to existing, abandoned burrows more attractive than other forms of dispersal. Any such difference, however, is expected to be very minor.

5.5.5 Community Impact

This section considers potential impacts on human distribution or population growth, social structure, employment opportunities, transportation, industrial or commercial activities, housing, and personal income. None of the alternatives is expected to significantly impact the community in these regards. The one community impact anticipated is to the Native American community, to which impacts were considered under the umbrella of heritage resources.

5.5.6 Public Services/Taxes/Utilities

MSP's actions identified in this Management Plan and environmental assessment (EA) would not result in any changes to or impacts on public services, taxes, or utilities. No secondary, cumulative, or significant impacts on public services, taxes, or utilities would result.

5.6 Resource Issues Considered but Eliminated from Detailed Analysis

MSP has not identified any potential impacts under any of the considered alternatives for the following resources:

- **Water:** The presence or absence of prairie dogs has little or no impact on water quality, quantity, or distribution.
- **Soil:** No appreciable effect is expected on soil quality, quantity, or moisture content under any of the alternatives. Prairie dogs reduce cover, and this could theoretically result in increased wind and water erosion, but in the absence of desertification it is hard to imagine prairie dogs having a large enough impact to materially affect soil erosion.
- **Air:** Removing prairie dogs will have no effect on air quality. None of the control methods would have any significant effect on air quality; however, to ensure that even localized impacts are not experienced, should aluminum phosphide be applied MSP will follow all label instructions and consult with the Montana Department of Agriculture (as practical) prior to application.
- **Visitation:** Current visitation at FPBJ is approximately 16,000 visitors per year. In addition to the general public, this includes members of the Blackfeet Tribe who use the site for ceremonies, and students. Data on the motivations of visitors is unavailable, but FWP believes, based on visitor feedback and park marketing, that the vast majority of park visitors seek to interact with the historical aspects of the site. While a minority of visitors appear to come primarily to observe prairie dogs and associated birds, FWP does not believe this group large enough for control of prairie dogs to materially alter future visitation.

6. Summary of Evaluation and Determination of Whether an Environmental Impact Statement is Required

The above review has identified that the No Action Alternative would have significant adverse impacts on cultural, archeological, and heritage resources. Such impacts are contrary to MSP's mission and the primary objective of First Peoples Buffalo Jump State Park.

MSP understands that this decision creates the appearance of conflict between protecting heritage resources and protecting wildlife resources. However, black-tailed prairie dogs are currently estimated to occupy 2.4 million acres in North America (Hamilton, 2009, 63348), including more than 190,000 acres in Montana (Rauscher et al., 2013). There is only one buffalo jump of FPBJ's size and quality in the United States (Aaberg, 2013). Consistent with FPBJ's primary objective—heritage resource protection—and the overall vitality of the prairie dog population, the unique heritage resources at First Peoples Buffalo Jump State Park need to be protected from prairie dogs.

The Removal Alternative would protect heritage resources, and would not have significant adverse impacts on the human environment. However, full removal of prairie dogs would not meet secondary objectives of the park, including retention of a prairie dog population and a landscape with native flora and fauna.

The Adaptive Management Alternative would protect heritage resources and would still achieve secondary objectives of the park. MSP proposes to utilize this document as a Prairie Dog Management Plan for FPBJ, proceeding as the Adaptive Management Alternative proposes to a) remove prairie dogs to the extent possible in the High Threat to Heritage Resources Zone, and b) remove prairie dogs in the Low Threat to Heritage Resources Zone where they threaten heritage resources, while attempting to retain a prairie dog population as well. MSP will utilize the tools identified as acceptable to MSP in **Section 4.3** in the measure and mix that best achieves these objectives for a given location at a given time.

Based on an evaluation of the primary, secondary, and cumulative impacts to the physical and human environment, no significant negative impacts from the proposed Adaptive Management Alternative/Prairie Dog Management Plan were identified. In determining the significance of the impacts of the proposed project, MSP assessed the severity, duration, geographic extent, and frequency of the impact, the probability that the impact would occur or reasonable assurance that the impact would not occur. MSP assessed the importance to the state and to society of the environmental resource or value affected; any precedent that would be set as a result of an impact of the proposed action that would commit MSP to future actions; and potential conflicts with local, federal, or state laws. As this EA revealed no significant impacts from the proposed actions, an EA is the appropriate level of review and an environmental impact statement (EIS) is not required.

7. Public Participation and Document Development

7.1 Summary of EA Development

This environmental assessment is the culmination of several years of internal consideration. MSP has informally discussed the need to protect heritage resources from prairie dogs within the agency, with tribal organizations, and with a variety of experts.

A previous internal review period occurred from February 1 to February 19, 2016. The following agency staff and partners were consulted with:

- Mary Sexton, Vice Chair, Montana State Parks & Recreation Board
- Sara Scott, Heritage Resource Program Manager, Montana Fish, Wildlife & Parks
- Gary Bertellotti, Region 4 Regional Supervisor, Montana Fish, Wildlife & Parks
- Graham Taylor, Region 4 Wildlife Manager, Montana Fish, Wildlife & Parks
- Kristina Smucker, Region 4 Nongame Biologist, Montana Fish, Wildlife & Parks
- Department of Natural Resources & Conservation (DNRC)
- Stephen Vantassel, Vertebrate Pest Specialist, Montana Department of Agriculture

Park staff also met with neighboring landowners, ranchers, and farmers to update them on the process and get initial feedback on control methods and outcomes. Ongoing informal consultation also occurred with agency partners over the course of 2016.

MSP sought both public comment and formal consultation with concerned agencies on the Draft Prairie Dog Management Plan and EA.

7.2 Environmental Assessment Contributors

This environmental assessment was prepared by Maren Murphy, MSP Parks and Recreation Planner, and John Adams, Principal, Leitrim Consulting. The assessment incorporates and draws heavily upon work completed for MSP in 2012 by Mike DaSilva, Senior Scientist, Tetra Tech EM Inc. Individuals who have contributed to or been consulted regarding this document also include: Melissa Baker, MSP Chief of Operations; John Taillie, MSP Region 4 Parks Manager; Rick Thompson, MSP FPBJ Park Manager; Sara Scott, MSP Heritage Resources Program Manager; Stan Wilmoth, Montana SHPO; and Stephen Vantassel, Vertebrate Pest Specialist, Montana Department of Agriculture.

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Appendix A. Montana State Historical Preservation Office Consultation

Big Sky. Big Land. Big History.
Montana Historical Society

Historic Preservation
Museum
Outreach & Interpretation
Publications
Research Center

Friday, December 11, 2015

SARA SCOTT
HERITAGE PROGRAM MANAGER
FWP
TRAVELER'S REST STATE PARK
POB 995
LOLO MT 59847

RE: Prairie Dog Depredations at People's Jump National Landmark

Dear Sara:

Thank you for providing us photographic documentation of critical faunal turbation resulting from prairie dog colony activity at the First People's Jump National Historic Landmark State Park. The impacts of semifossorial vertebrates has been recognized in the archaeological literature for some time (see e.g. Waters 1992 Principles of Goarchaeology and Heizer and Graham 1967 Guide of Field Methods in Archaeology). While some effects such as transport and mislocation of carbon 14 sample material may be unlikely at First People's – were that material found to be present it would be a critically important loss. More obvious impacts are krotovinas (sediment filled burrows) resulting in churning and translocation of soil matrix in extensive underground cavities and tunnels. Lithic scatters may "disappear." Partial to complete disturbance of the soil matrix can occur. Also obvious is the lateral and vertical movement of even large stones in rock alignments, stone rings and other surface features. Rock cairns collapse. We can see large stones are being moved and lowered during the disturbance of the significant archaeological complex here. As with krotovinas this movement may be difficult to reconstruct later where shallow soil matrix is relatively homogeneous.

The visibility of the surface features at First People's is a critical and highly invocative value to public interpretation and broader Native American community values. This visibility is in the process of being severely diminished. We concur that the prairie dog activity is extremely detrimental and should be vigorously addressed.

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State Archaeologist/Deputy, SHPO

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