



National Park Service
U.S. Department of the Interior
Devils Tower National Monument
Devils Tower, Wyoming

Black-Tailed Prairie Dog Management Plan / Environmental Assessment

August 2013



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Black-Tailed Prairie Dog Management Plan / Environmental Assessment

Summary

Devils Tower National Monument (Monument) proposes to manage black-tailed prairie dogs (*Cynomys ludovicianus*) within the Monument. The Monument does not currently have a prairie dog management plan or standard operating procedures for management of disease outbreaks in prairie dog populations. Black-tailed prairie dogs have become an issue in high-use visitor areas, such as the campground and picnic area, threatening resources, infrastructure and visitor safety. This proposal is needed to manage black-tailed prairie dogs as a keystone species, protect visitors and infrastructure, and develop procedures for the management of disease outbreaks.

This environmental assessment evaluates three alternatives addressing the management of prairie dogs and standard operating procedures for disease management. Presented are a No-Action alternative, a Passive Management alternative, and an Adaptive Management alternative. The No-Action Alternative describes the continuation of current conditions if present management actions remain unchanged. The Passive Management alternative describes using passive relocation and barriers to redirect prairie dogs from the exclusion area to the allowable areas. The Adaptive Management alternative would integrate several methods, passive and active, providing managers with multiple options and the ability to adapt management efforts to accommodate for different situations.

This environmental assessment complies with the National Environmental Policy Act (NEPA) to provide the decision-making framework that: 1) analyzes a reasonable range of alternatives to meet objectives of the proposal; 2) evaluates potential issues and impacts to Devils Tower National Monument's resources and values; and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics included are those where the impacts may be greater-than-minor, or of great enough concern to warrant inclusion regardless of the level of impact. The resource topics included in this document include: Wildlife, Visitor Use and Experience, and Monument Operations. All other resource topics have been dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this proposal. Public scoping was conducted to assist with the development of this document, and most of the comments received expressed support of the proposed management plan.

Public Comment

The environmental assessment will be open August 1, 2013 for public review. If you wish to comment on this environmental assessment, you may post comments online at <http://parkplanning.nps.gov/deto> or mail comments to Superintendent; Devils Tower National Monument; PO Box 10; Devils Tower, Wyoming 82714. Comments are due by August 30, 2013. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment-- including your personal identifying information-- may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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CHAPTER 1: PURPOSE AND NEED

1.1 Introduction

Devils Tower National Monument (Monument) is located in Crook County, Wyoming, on the northwestern edge of the Black Hills. The Monument was established under the authority of the Antiquities Act by President Theodore Roosevelt on September 24, 1906 and is managed by the National Park Service (NPS). Devils Tower, a monolith of igneous rock, rises 867 feet above the surrounding grassland and ponderosa pine forest. It is a dominant landmark in the northern Great Plains. The 1,347 acre landscape of the Monument contains a small portion of short grass prairie that includes a black-tailed prairie dog (*Cynomys ludovicianus*) population of approximately 40 acres. At Devils Tower National Monument, black-tailed prairie dogs (prairie dogs) are the second most popular visitor attraction after the tower itself. Due to limited habitat in the Monument, prairie dogs have become an issue in developed high-use visitor areas, such as the campground and picnic area.

This environmental assessment (EA) has been prepared to examine the environmental impacts associated with developing a Prairie Dog Management Plan (PDMP) at Devils Tower National Monument. The reason for the PDMP is to provide an approach to manage prairie dogs in the Monument. This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and NPS Director's Order (DO)-12 (Conservation Planning, Environmental Impact Analysis, and Decision-Making).

1.2 Background

Theodore Roosevelt originally set aside 1,153 acres as Devils Tower National Monument in 1906 as the nation's first national Monument for "the lofty and isolated rock ... an extraordinary example of the effects of erosion in the higher mountains as to be a natural wonder and an object of historic and great scientific interest..."(Proc. No. 658). While the black-tailed prairie dog is not specifically identified by name as a resource to be protected in the establishing legislation or its expansion, the prairie dog is an integral element of the mixed-grass prairie ecosystem. NPS Management Policies Section 4.4 and the NPS-77 Natural Resources Management Guideline state that the NPS will seek to perpetuate the native animal life as part of the natural ecosystem of parks.

The prairie dog functions as a keystone species because of the many wildlife species that depend on prairie dogs or the unique habitat they create. A number of species are wholly or partially dependent on prairie dog colonies as prey or for habitat. Prairie dogs provide a direct food source for predators, and their activities nurture an entire web of life. Up to eighty-nine species of wildlife have been identified as being in some way associated with prairie dog colonies. Seeds and insects exposed by prairie dog grazing attract meadowlarks, lark buntings and other birds. Declines of prairie dogs have, in turn, impacted animals that depend on the prairie dog for food and shelter. For example, with their nesting-sites disappearing, burrowing owls are declining. Black-footed ferrets, and raptors like ferruginous hawks and golden eagles, which depend heavily on prairie dogs, are also affected.

However, prairie dogs have become an issue in high-use visitor areas threatening resources, infrastructure and human health and safety. As defined by the National Park Service Management Policies (2006), "pests are living organisms that interfere with the purposes or management objectives of a specific site within a park, or that jeopardizes human health or safety."

From 1998 to 2003 the black-tailed prairie dog was listed as a candidate species under the Endangered Species Act and methods of control were very limited. Live-trapping was the only control method approved in Devils Tower National Monument's 2000 Environmental Assessment for the Control of Black-tailed Prairie Dogs. In 2004, after intensive study, the US Fish and Wildlife Service removed the black-tailed prairie dog from the candidate species list. Trapping was found to be ineffective in some locations and situations. From time to time, a categorical exclusion has been issued allowing lethal control for the removal of individual prairie dogs that pose imminent danger to visitors or immediate threat to park resources. The approved method of lethal control was carbon monoxide gas cartridges. Currently, live-trapping is the only approved method of prairie dog management at Devils Tower.

1.3 Purpose and Need of the Management Plan

The Monument does not currently have a prairie dog management plan or standard operating procedures for management of disease outbreaks in prairie dog populations. As a keystone species, the prairie dog population needs to be managed at healthy levels. A comprehensive PDMP with standard operating procedures for plague management is needed to ensure a healthy ecosystem.

With limited potential for colony expansion due to lack of suitable habitat and location of Monument resources, prairie dogs periodically encroach on high-use visitor areas including the campground, picnic area, amphitheater, and sculpture area (see photos 1-4, page 4). Prairie dogs inhabiting these areas endanger human health and safety by creating tripping hazards and bringing visitors in close proximity to prairie dogs.

Prairie dogs have long been known to be potential carriers for sylvatic plague (bubonic plague in humans). Fleas that use prairie dogs as hosts are known to carry the plague bacteria, *Yersinia pestis* (CDC, 2010). In the early 1990s there was a prairie dog die-off where approximately 99% of the colony was reduced. Plague could not be identified as the cause, but was suspected (Holbeck, personal communication). Although plague has never been confirmed in prairie dogs in Devils Tower National Monument and the isolation of the colony makes it unlikely (Britten, personal communication), some carnivores, including fox, coyote, and bobcat can bring plague to the town. Most public health officials believe that the chance of humans contracting plague from prairie dogs or fleas is extremely low, because fleas are host specific and therefore avoid humans (Cully et al., 2006). However, public awareness of the potential for prairie dogs to act as a vector for the disease is needed and, despite the low risk to human safety, strategies are needed for dealing with potential plague outbreak.

As a result, management is needed to ensure that prairie dog encroachment does not create potentially unsafe or hazardous conditions that could affect human health and safety.

In addition, prairie dog encroachment in high-use visitor areas endangers Monument infrastructure (see photos 1-4). In developed areas burrowing activity has the potential to undermine walkways, structures, and utilities, and to hinder Monument operations. Locations containing underground electrical and fiber optic lines are especially vulnerable. High-use visitor areas and infrastructure need to be protected from degradation due to prairie dog colony expansion.

To effectively manage prairie dogs, resource managers need access to more prairie dog management tools. An evaluation of all available management methods for prairie dogs and potential associated impacts is needed to allow resource managers to make the best possible management decisions. Triggers need to be determined for resource managers to decide when action is needed and what is most appropriate. A decision-making process is needed so that management decisions can be easily determined and justified.

A Plan/EA is needed to evaluate management options, and to achieve compliance with NEPA for future prairie dog management projects. With a number of available treatment options, resource managers would be able to select and implement the most appropriate management approach in the future. A Plan/EA, including standard operating procedures for plague monitoring and outbreak, would help ensure that relevant policies and mandates are implemented to protect visitors and resources.

The purpose of this Plan/EA is to develop an approach to manage prairie dogs in the Monument in a way that poses the least possible risk to people, Monument resources, and the environment. The desired goals of the PDMP are to maintain a healthy prairie dog population, protect Monument resources and infrastructure, and ensure human health and safety. The resulting management under this plan should promote a healthy mixed-grass prairie ecosystem within the Monument and ultimately help prevent loss of the prairie dog colony through disease. This plan represents a continued commitment to protect Monument staff and visitors while preserving valuable Monument resources. These resources include the prairie dog itself and the numerous interdependent species that rely on the prairie dog and the habitat alterations that prairie dogs make.

The objectives of this plan will be to:

1. Develop a Plan/EA that would provide the Monument with the strategies and compliance necessary to manage prairie dogs.
2. Maintain a healthy prairie dog population with a distribution that would fulfill the ecological role of the species and allow other Monument objectives to be achieved.
3. Reduce the probability, severity, and impact of a plague outbreak.
4. Protect human health and safety and Monument infrastructure from hazards and damage associated with prairie dogs.

Photo 1



Photo 2



Photo 3



Photo 4



1.4 Desired Future Condition

Desired Future Condition of the Black-Tailed Prairie Dog Population and Habitat at Devils Tower National Monument

Prairie dog habitat at Devils Tower National Monument is restricted to the current colony and the surrounding area. The prairie dog colony occupies approximately 40 acres in the southeast corner of the Monument. There is limited potential for colony expansion due to lack of suitable habitat and location of Monument resources (sculpture, campground, amphitheater, and picnic area). Expansion is restricted to the north due to increased slope and to the south and east by the Belle Fourche River. There is a small area that could be potential habitat to the west (between the current colony and the Monument administration buildings) but this area has never historically been occupied by prairie dogs. Expansion of prairie dogs outside the current colony boundaries results in direct prairie dog/human contact and potential damage to Monument resources. Burrowing activities of the prairie dogs can compromise infrastructure or facility integrity, and could pose hazards to human health, safety and welfare.

The desired condition under this PDMP would include a prairie dog population, in terms of minimum areal extent and distribution, which is sufficient to fulfill the ecological role of the species. This PDMP intends to maintain a black-tailed prairie dog population that can persist through environmental disturbances, drought, and disease outbreak. The population would be maintained at a level that can coexist with other resources, particularly species that depend on prairie dogs and their habitat, including vegetation. At the same time, the population would be maintained at a level that would not compromise visitor health and safety, Monument resources, infrastructure or other Monument goals and objectives.

Many factors are involved in determining a healthy sustainable population number, including precipitation, vegetation composition and density, temperature, predation and disease. In ideal conditions within the Monument, the maximum population density tolerated by prairie dogs is 20-35 prairie dogs/acre (Licht; personal communication). The desired condition for the population size under this PDMP would be to maintain a density within the tolerated 20-35 prairie dogs/acre.

The desired habitat condition in the prairie dog colony under this PDMP would include a vegetation community comprised of native species with a complement of plant species that reflects the typical species composition associated with healthy prairie dog complexes (Agnew *et al.*, 1986; Detling and Whicker, 1988). The fauna typically associated with the prairie dog would be present and the interdependence between species that is specific to the altered prairie dog colony habitat (i.e. system of burrows, soil mixing, increased water infiltration) would be exhibited.

To achieve the goals of this plan, natural processes would be allowed to continue wherever possible. It is understood that prairie dog colonies are not static and they would be allowed to expand and contract largely unimpeded, within areas designated as potential colony (See Fig.2). However, there are areas of suitable prairie dog habitat where prairie dog colony expansion would not be allowed (Fig. 2), such as developed zones within the Monument (e.g. campground, amphitheater, sculpture and picnic area). Due to lack of suitable habitat and location of Monument infrastructure, the only area in the Monument prairie dogs would

be permitted is the designated potential colony area (Fig. 2). Historically, this is the only area in the Monument prairie dogs have occupied. Measures would be taken to control prairie dogs in areas where they conflict with other Monument management goals.

Visitors would continue to be able to view prairie dogs in their natural habitat, observing their foraging and social habits in conjunction with NPS interpretive messages, which would help Monument visitors understand the role that prairie dogs play in the prairie ecosystem.

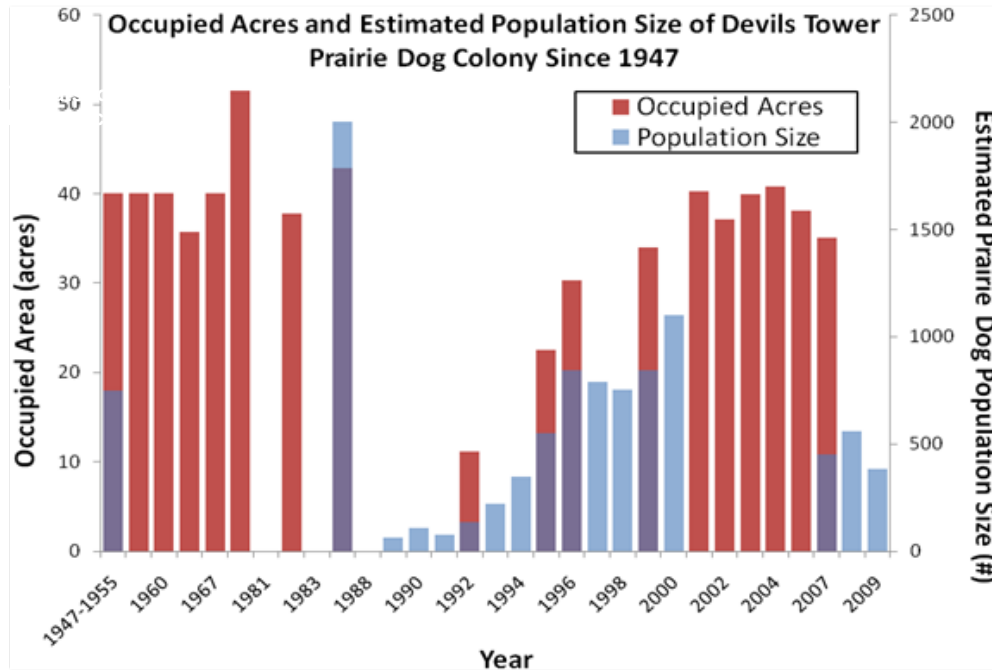


Figure 1. Black-tailed Prairie Dog Occupied Acres and Estimated Population Size at Devils Tower National Monument since 1947.

Recent Trends Not On Graph		
Year	Population	Acres
2010	570	41.4
2011	500	44.7
2012	509	48.5

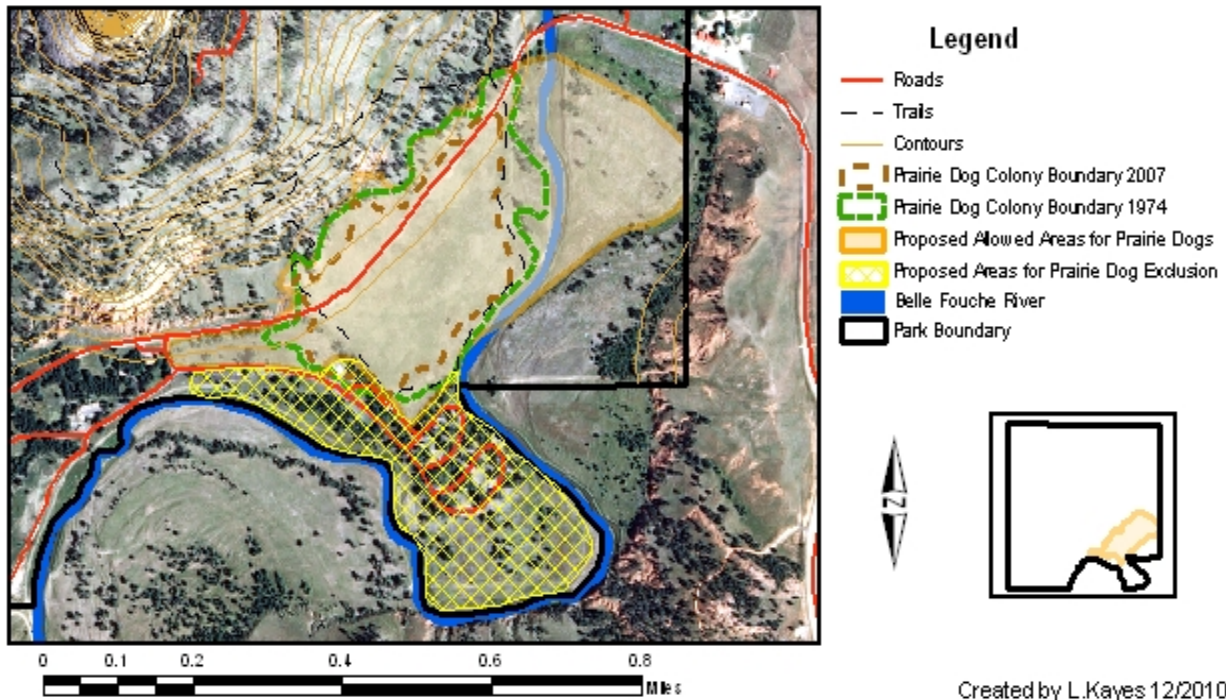


Figure 2. Historic (1974) and modern (2007) prairie dog colony boundaries, and allowed areas for prairie dog and areas for exclusion.

1.5 Relationship to Other Plans and Policies

All management procedures and planning documents must be in compliance with National Park Service Management Policies (2006) and Director's Order 12 – Conservation Planning, Environmental Impact Analysis, and Decision-Making.

This EA is prepared in accordance with regulations of the Council on Environmental Policy Act (CEQ) (40 DFR 1500 et seq.) and part 516 of the U.S. Department of the Interior's Departmental Manual (516 DM). The National Environmental Policy Act (NEPA) is the basic national charter for environmental protection; among other actions it calls for examination of impacts on components of affected ecosystems. Section 106 of the National Historic Preservation Act of 1966 (as amended through 2000) mandates that federal agencies take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places.

This Plan/EA provides basic prairie dog management guidelines to help preserve cultural resources, structures, Monument grounds, and natural resources, while also protecting the health and safety of both staff and visitors. As new information and IPM methods would develop over time, the PDMP plan should be reviewed and updated.

Authorities, Legal Requirements, Policy

National Park Service (NPS) policy establishes an IPM approach as the required method for managing pests in the NPS (NPS Management Policies 2006, 4.4.5.2). Development of an IPM program is based on and directed by various policies, laws, regulations, executive

orders, and the enabling legislation that established each NPS unit. The following documents provide direction for management relating to pest management. Documents that specifically relate to IPM practices at Devils Tower National Monument are detailed below.

Federal Regulations

Extensive federal legislation has been enacted to ensure that both cultural and natural resources are protected and preserved within National Parks. The following legislation must be considered when implementing the prairie dog management plan. (Further NPS-specific detail is provided below under the heading of NPS Directors Orders.)

- 1892 Executive Order 6144-'92 (June 22, 2892 – No. 28A)
- 1916 National Park Service Organic Act
- 1906 National Monument Proclamation for Devils Tower National Monument
- 1906 Devils Tower National Monument Enabling Legislation
- 1918 Migratory Bird Treaty Act
- 1935 Historic Sites Act
- 1947 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- 1949 National Trust for Historical Preservation Act
- 1966 National Historic Preservation Act (NHPA)
- 1969 National Environmental Policy Act (NEPA)
- 1972 Federal Environmental Pesticide Control Act
- 1973 Endangered Species Act
- 1979 Archeological Resource Protection Act (ARPA)
- 1994 Occupational Health and Safety (OSHA) Hazard Communication Standard
- Executive Order 11870 concerning Animal Damage Control
- Executive Order 11987 concerning Exotic Organisms
- Executive Order 12088 concerning Pollution Control

Additional guidelines relating to resource management are found in NPS-77 Natural Resources Management Guideline including; Vegetation Management; Native Animal Management; Freshwater Resources Management; Endangered, Threatened, and Rare Species Management; Exotic Species Management; Hazardous Waste Management; and Public Health and Safety are all discussed in chapter two while chapter three focuses on Agricultural Use, Right-of-Way and Easements, and Backcountry Recreation Management. Environmental Compliance is discussed in chapters four and five providing helpful information regarding Special Use Permits and Collections Management.

National Park Service Director's Orders (DO):

(Available online at <http://home.nps.gov/applications/npspolicy/DOrders.cfm>)

- DO 12 Conservation Planning, Environmental Impact Analysis, and Decision-Making (NEPA)
- DO 13 Environmental Leadership
- DO 28 Cultural Resources Management
- DO 36 Housing Management
- DO 77-7 Integrated Pest Management
- DO 77-8 Threatened and Endangered Species
- DO 83 Public Health

DO 12 Conservation Planning and Environmental Impact Analysis, and Decision-making along with the companion Handbook 12; together, these documents set forth the policy and procedures by which the National Park Service carries out its responsibilities under the National Environmental Policy Act (NEPA)

This Prairie Dog Management Plan would be consistent with ongoing or planned management activities within the Monument. Specific plans and policies that relate to the actions proposed in this prairie dog management plan are summarized below.

The 2001 Devils Tower Final General Management Plan/Environmental Impact Statement. The General Management Plan (GMP) outlines proposed actions to be taken to protect Monument resources and enhance visitor experiences at the Monument. The Monument's GMP states that the Monument will "[c]omplete an inventory of plants and animals in the Monument and regularly monitor the distribution and condition (e.g. health, disease) of selected species that are (a) indicators of ecosystem condition and diversity, (b) rare or protected species, (c) invasive exotics, (d) native species capable of creating resource problems (e.g. habitat decline due to overpopulation)" and "take mitigating actions to restore native species and their habitats where warranted" (NPS 2001). In addition the GMP states that "[v]isitor and employee safety and health will be protected", visitors will have the "opportunity to understand, appreciate, and enjoy the Monument", and the Monument will "[e]nsure that all programs and facilities in the Monument are accessible to the extent feasible" (NPS 2001). A new Environmental Assessment is underway making amendments to the preferred alternative of the General Management Plan that includes the retention of the campground, amphitheater, and picnic area. This black-tailed prairie dog management plan is consistent with the current GMP and supports the monitoring of prairie dog populations and the protection of visitor safety and health and ability to enjoy and access all facilities in the Monument.

Devils Tower National Monument Fire Management Plan 2004. The Fire Management Plan (FMP) provides specific guidance and procedures for using fire to restore and perpetuate natural processes in the Monument. This is done by accomplishing the Monument's fire management objectives, such as: "manage wildland fires so that Monument resources are protected from damage," "use wildland and prescribed fire as appropriate as a tool to meet resource management objectives," and "maintain and restore where possible the Monument's natural resources and natural ecological conditions that would prevail without modern civilization." Manual fuel reduction would be used in areas with heavy fuels accumulation and cultural resources that might be damaged by prescribed or wildland fire and prescribed burning would be used in areas with fewer values at risk and lower fuel loading. With respect to the black-tailed prairie dog, it was determined that the preferred alternative would have minimal negative impacts on small mammals. Because prairie dogs prefer disturbed areas with low vegetation, prescribed fire can influence the size, location, and grazing pressure of prairie dog colonies (Augustine et al., 2007; Klukas, 1998). However, the current prairie dog colony expansion is restricted due to steep slopes and the Belle Fourche River rather than vegetation. Therefore, it is unlikely that prescribed fire even in the vicinity of the prairie dog colony would impact prairie dogs. There is a proposed prescribed burn in the prairie dog unit in spring 2017 and this action would be conducted in accordance with the 2004 FMP.

Northern Great Plains Exotic Plant Management Plan and Environmental Assessment

2005. The Exotic Plant Management Plan uses an integrated pest management approach to exotic plant management. The management plan would have beneficial effects on wildlife by eliminating exotic plants and increasing native vegetation. The Exotic Plant Management Plan includes the following practices regarding implementation in prairie dog colonies: 1) physical disturbance would be avoided; 2) some mechanical treatments such as tilling would not be used; 3) pesticides would be used only if there is no other alternative; 4) only low potential toxicity pesticides would be used; 5) herbicides that do not readily break down in the soil would not be used; and 6) UTVs would avoid physically disturbing colonies. This prairie dog management plan would include mitigations to reduce the spread of exotic plant species, consistent with the Exotic Plant Management Plan.

Wyoming Black-Tailed Prairie Dog Draft Management Plan. The Wyoming Black-Tailed Prairie Dog Working Group released the final draft of their prairie dog management plan in 2001. This document identifies and coordinates actions to facilitate the conservation of the black-tailed prairie dog in Wyoming. The goal of this plan is to “maintain the current abundance and distribution of black-tailed prairie dogs in Wyoming.” The current management plan is consistent with this goal and helps meet the first two objectives of the plan to: “[m]anage for a statewide total of no less than 200,000 acres of occupied black-tailed prairie dog acreage” and “[m]aintain presence of the black-tailed prairie dogs in all of the 11 counties in the primary range of the species in Wyoming.” This management plan is consistent with the Wyoming Black-Tailed Prairie Dog Management Plan by maintaining the historical abundance, distribution and acreage of prairie dogs within the Monument.

Multi-State Conservation Plan for the Black-Tailed Prairie Dog in the United States.

The Wyoming Game and Fish Department participates in the Multi-State Conservation Plan for the Black-Tailed Prairie Dog. The eleven states within the range of the black-tailed prairie dog began a multi-state conservation effort in 1998 by forming the Interstate Black-tailed Prairie Dog Conservation Team. The Conservation Team developed the Black-Tailed Prairie Dog Conservation Assessment and Strategy (CA&S) in 1999 (Van Pelt, 1999). The Multi-State Conservation Plan (MSCP) is an addendum to the CA&S, and was prepared to provide guidelines under which management plans would be developed by individual states and their respective working groups (Luce 2003). The state management plans would contain the specific and measurable actions, deadlines, and objectives for that state. The MSCP target objectives include at a minimum maintaining the currently occupied acreage of black-tailed prairie dogs in the U.S., increasing prairie dog acreage to 1,693,695 acres by 2011, and maintaining prairie dog distribution over at least 75% of the counties in the historic range or at least 75% of the historic geographic distribution (Luce, 2003). The target objectives in the MSCP are minimum values based on a range-wide analysis, and the states would build upon those minimum recommendations (Luce, 2003). This habitat management plan is consistent with the MSCP by maintaining the historical abundance, distribution and acreage of prairie dogs within the Monument.

A Plan for Bird and Mammal Species of Greatest Conservation Need in Eastern

Wyoming Grasslands 2006. Wyoming Department of Game and Fish released this plan that encompasses black-tailed prairie dog management concerns, goals and objectives in eastern Wyoming. This document provides guidance for the management of prairie dogs on federal, state, and private lands in the state. The objectives of this plan are to “enhance and conserve grassland habitat quality, and where opportunities exist, increase grassland

habitat quantity, thereby improving the long-term viability of terrestrial wildlife species endemic to grasslands, maintain effective inventory and monitoring programs for both habitat and wildlife; implement this plan's proposed conservation actions, recommended support actions, and species-specific actions and monitoring strategies; develop an understanding of the needs and values of private landowners and resource managers to identify areas where WGFD conservation interests complement or enhance landowner needs; develop an information source for landowners that want to improve or restore grassland habitat." Specific to black-tailed prairie dogs and relevant to Devils Tower National Monument prairie dog populations, the plan proposes to maintain similar acreage to black-tailed prairie dog habitat currently occupied, evaluate monitoring results to ensure objectives from Luce (2003) are met, continue inventory and monitoring efforts, and develop information about the role of prairie dogs in ecosystems. This habitat management plan is consistent with the Plan for Birds and Mammal Species of Greatest Concern.

1.6 Scoping

Scoping is the process to identify resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. For this document, Devils Tower National Monument conducted both internal scoping with appropriate NPS staff and external scoping with the public and interested/affected groups and agencies.

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from Devils Tower National Monument, the NPS Intermountain Region, and Midwest Region. The interdisciplinary team included biologists, wildlife biologists, program managers, public health officers and a landscape architect. The purpose and need for the project, various alternatives, potential environmental impacts, and possible mitigation measures were discussed.

During internal scoping meetings, it was determined that the Plan/EA should not be so specific or complicated that it is no longer useful. The document also should not be so specific or restrictive that it prevents prairie dog management actions from being implemented on a case-by-case basis. In general, it is agreed that this plan should:

- Be both integrated and adaptive.
- Be specific enough to address issues in high-use visitor areas.
- Be general (broad) enough to address prairie dog management actions throughout the Monument.
- Be flexible enough to allow management on a case-by-case basis without becoming too restrictive.
- Mitigate potential impacts to resources.
- Be a long term management tool.

External Scoping

On November 3, 2011 scoping brochures were sent out to 129 individuals and organizations. Brochures were mailed to local businesses and land owners, area post

offices, senators, representatives, county commissioners, land management agencies, 24 tribal councils, 11 newspapers, 18 radio stations, the governor's office, and others.

The scoping brochure included:

- Information on the scoping process
- A description of the issue, need for action, objectives, and proposed alternatives
- Information on how to comment on the proposed action

Information was provided on how to submit comments by mail, in person, and on the Planning, Environment and Public Comment (PEPC) site. The public was encouraged to provide their comments by *December 3, 2011.

Press Releases

On November 3, 2011 a one page press release was sent via email to 100 contacts including individuals, local businesses and land owners, senators, representatives, newspapers, radio stations, tribal members, and others expressing interest in Devils Tower news.

The press release included:

- A description of the issue, need for action, objectives, and proposed alternatives
- Instructions on how to request information on the scoping process and brochure
- Information on how to comment on the proposed action

In the press release, information was provided on how to request information and submit comments by mail, in person, and on the Planning, Environment and Public Comment (PEPC) website. The public was encouraged to provide their comments by *December 3, 2011.

Internet

An announcement was placed on the front page of the Monument website www.nps.gov/deto announcing the request for comments. Instructions for public comment by mail, in person and on line through the PEPC website were given. The public was encouraged to provide their comments by *December 3, 2011.

PEPC

On November 3, 2011 the project scoping brochure and detailed map were posted on the Planning, Environment and Public Comment (PEPC) website. The public was encouraged to provide their comments by *December 5, 2011.

* The deadline was set as December 3. That date fell on a weekend, the Chief of Resources found it prudent to extend the date to file comments on the Planning, Environment & Public Comment (PEPC) website to Monday December 5. To maintain consistency, we would accept comments on PEPC, by mail, or hand delivery by Monday, December 5.

Comment Summary

A total of 13 responses were received, 3 were “no comment” (omitted from summary and analysis). Of these responses, 4 were received via postal mail and 9 were received electronically through PEPC. Comments were reviewed and organized according to management strategies or area of concern. A total of 8 strategies were suggested, 2 of which were utilized in the plan. Strategies utilized include ‘improvements to existing walkways and visitor-use areas’ and ‘Reverse-Dispersal Translocation’. The remaining 6 strategies were dismissed for various reasons (see 2.3 Alternatives Considered and Dismissed). Public scoping also identified 4 issue topics (visitor safety, visitor experience, habitat concerns, and management issues) all addressed throughout the document.

Impact Topics

Impact topics were used to focus the evaluation of the potential environmental consequences of the alternatives. Issues and concerns affecting the proposed Prairie Dog Management Plan were identified by NPS specialists. Impact topics are the resources of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. Impact topics for this project have been identified by public and internal scoping sessions and on the basis of federal laws, regulations, and orders; NPS 2006 Management Policies; and NPS knowledge of resources at Devils Tower National Monument. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

1.7 Impact Topics Retained For Further Analysis

Impact topics that are carried forward for further analysis in this EA include:

- Wildlife
- Visitor Use and Experience
- Monument Operations

1.8 Impact Topics Dismissed From Further Consideration

Issues and concerns affecting this project were identified by NPS specialists, and input from other federal, state, and local agencies. After public scoping, issues and concerns were distilled into distinct impact topics to facilitate the analysis of environmental consequences. This allows for a standardized comparison between alternatives based on the most relevant information. The impact topics were identified on the basis of federal laws, regulations, and orders; NPS Management Policies (2006a); and NPS knowledge of limited or easily impacted resources. The rationale for dismissing specific topics from further consideration is given below.

In this section, the NPS takes a “hard look” at all potential impacts by considering the direct,

indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates “major” effects as “significant” effects. The identification of “major” effects would trigger the need for an Environmental Impact Statement (EIS). Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines “measurable” impacts as moderate or greater effects. It equates “no measurable effects” as minor or less effects. The use of “no measurable effects” in this EA pertains to whether the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the NPS uses “no measurable effects” to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with CEQ regulations at 1500.1(b).

In this section of the EA, the NPS provides a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- they do not exist in the analysis area, or
- they would not be affected by the proposal, or the likelihood of impacts is not reasonably expected, or
- through the application of mitigation measures, there would be minor or less effects (i.e. no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct, indirect, and cumulative effects is presented.

Topography, Geology, and Soils

According to NPS Management Policies 2006, the NPS will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS, 2006a). These policies also state that the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

Devils Tower, the geologic formation, is situated over half of a mile to the northwest of prairie dog town. The steep terrain makes it inaccessible to prairie dogs. No action in this plan would diminish the integrity of the Tower in any manner. Soil disturbance within the proposed Prairie Dog Management Plan would be minor, involving closing prairie dog burrows in high-use visitor areas and installing barriers. Most projects within the proposed

plan would be in previously disturbed areas. Any disturbed areas would be rehabilitated upon completion of the projects. They would be reseeded as appropriate and de-compacted utilizing hand tools and, if necessary, agricultural implements to facilitate the revegetation process. Through the application of mitigation measures, there would be minor or less effects (i.e. no measurable effects) to topography, geology or soils from the proposal; therefore, this topic has been dismissed as an impact topic.

Vegetation

According to the NPS 2006 Management Policies, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). Existing vegetation in the project areas primarily consists of native and non-native grasses, including *Danthonia spicata* (Poverty oatgrass), *Hesperostipa comata* (Needle-and-thread grass), *Pascopyrum smithii* (Western wheatgrass), *Stipa spartea* (Porcupine grass), *Andropogon gerardii* (Big bluestem), *Nassella viridula* (Green needlegrass), and *Poa pratensis* (Kentucky bluegrass). *Pinus ponderosa* (Ponderosa pine) and other conifers and hardwoods occur adjacent to or within the project areas.

Vegetation displaced, disturbed, or compacted within the proposed Prairie Dog Management Plan would be minor, involving closing prairie dog burrows in high-use visitor areas and installing barriers. No trees would need to be removed.

Vegetation would be improved by the Prairie Dog Management Plan in areas where vegetative barriers are used. Transplants of native shrubs such as *Rosa arkansana* (prairie rose), *Rosa woodsii* (Wood's rose), or *Artemisia* spp. (sagebrush) and tall grasses such as *Achnatherum hymenoides* (Indian ricegrass), *Pascopyrum smithii* (western wheatgrass), *Pseudoroegneria spicata* (bluebunch wheatgrass), or *Andropogon gerardii* (big bluestem) would be planted in areas where future colony expansion is anticipated and would be undesirable (e.g. between prairie dog colony and the campground, amphitheater, and sculpture). Any exotic species encountered during planting of natural barriers would be removed according to NPS IPM guidelines. Through the application of mitigation measures, there would be minor or less negative effects (i.e. no measurable effects) to vegetation, and minor positive effects therefore, this topic has been dismissed as an impact topic.

Special Status Species

The Endangered Species Act of 1973 requires examination of impacts on all federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 Management Policies and Director's Order-77 Natural Resources Management Guidelines require NPS to examine the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS, 2006a). For the purposes of this analysis, the U.S. Fish and Wildlife Service and the Wyoming Game and Fish Department were contacted with regards to federally and state-listed species to determine those species that could potentially occur on or near the project area.

A letter from the U.S. Fish and Wildlife Service (USFWS, 2012) titled *Endangered, Threatened, Proposed, and Candidate Species and Their Designated and Proposed Critical*

Habitat That Occur In or May Be Affected by Actions in Crook County, Wyoming updated May 2012 indicated that the following species may be present in the project area:

Ute Ladies'-tresses (*Spiranthes diluvialis*)

Status: Threatened

Habitat: Seasonally moist soils and wet meadows of drainages below 7,000 ft.

Greater Sage-grouse (*Centrocercus urophasianus*)

Status: Candidate

Habitat: Sagebrush communities

Ute Ladies'-tresses

Potential habitat for *Spiranthes diluvialis* is not found on Devils Tower National Monument. It requires wetland habitat of short-stature grasses and grass-like plants. Across its range, it requires a combination of hydrological and successional conditions that are associated with this wetland vegetation. The nearest populations are in northern Converse County, WY (Heidel). Ute Ladies'-tresses, nor its habitat, exists at the Monument. No action in the PDMP would affect the species or its habitat.

Greater Sage-grouse

There are no known populations of Greater Sage-grouse in Devils Tower National Monument. The sage-grouse is considered "very rare or unconfirmed" at the Monument due to very limited suitable habitat. The Plan/EA would focus on maintaining prairie dog habitat and high-uses visitor areas at their current levels. The Plan/EA would produce very little to no change in habitat levels for the sage-grouse.

The Wyoming Game and Fish Department was contacted by letter on September 19, 2012 requesting consultation on state-listed species or designated critical or essential habitat in the proposed project area. After 60 days, no response was received.

Protection for migratory birds from pollution or other ecosystem degradations falls under the Migratory Bird Treaty Act. Some migratory birds may be potential transients of the general area, but the immediate project area contains little to no suitable habitat for migratory birds. There are no known nesting sites in this area, and these lands are not vital for foraging or roosting.

No threatened, endangered, or other species of concern are known to occur in the project area, and impacts to transient bird species would be negligible. Because these effects are minor or less in degree, this topic is dismissed from further analysis.

Water Resources

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and for regulating water quality standards for surface waters. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." NPS Management Policies 2006 requires the protection of water quality consistent with the Clean Water Act and state that the NPS will perpetuate surface water and groundwater as integral components of park aquatic and terrestrial ecosystems.

The proposed project area does not contain surface water, and is mostly dry, except for periodic runoff during storm events. Water quality, water quantity, and drinking water are not expected to be affected by the project; therefore, this topic is dismissed from further analysis in this document.

Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 Protection of Wetlands requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. As stated in the NPS Management Policies 2006 and Director's Order 77-1: Wetlands Protection, NPS policies strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1: Wetlands Protection, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

None of the proposed PDMP actions would occur in wetlands or affect wetlands, so these resources would not be impacted as a result of carrying out the preferred alternative. Because there will be no impacts to wetlands, no statement of findings will be prepared. In addition, because the proposed action would not result in impacts to wetlands; the topic is dismissed from further analysis in this document.

Floodplains

Executive Order 11988 Floodplain Management requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service, under NPS Management Policies 2006 and Director's Order 77-2: Floodplain Management, will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2: Floodplain Management, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains.

Some of the proposed area for prairie dog management lies within a 100-year floodplain. There would be no construction or activities in the Plan/EA that would affect the floodplain therefore, a statement of findings for floodplains would not be prepared. Because there would be no effects to floodplains in the project area, this topic is dismissed from further analysis in this document.

Archeological Resources

A 100% area survey was conducted in 1998 to determine the location of archeological resources within the Monument. In 2007, the University of South Dakota conducted condition assessments of known archeological sites within the Monument to provide an up-to-date assessment of the condition of archeological sites at Devils Tower National Monument. These assessments evaluate the impacts of resource management activities

within the park, including exotic plant management and prescribed fire to the archeological sites. According to the *Devils Tower National Monument Cultural Sites Inventory*, August 1998, one archeological site is located within the proposed prairie dog exclusion area and is presently void of prairie dogs. In addition, the site is outside any high-use visitor areas. The site is at a location where no management strategies in the PDMP would likely take place. In addition, the nature of the site is such that management proposed in the PDMP would have little or no impact on the site. If any management activity would uncover any unknown archeological resources, all activities would be suspended in that immediate area until appropriate NPS personnel could assess the find and make recommendations. Because the likelihood of impacts is not reasonably expected, the topic is dismissed from further analysis.

Historic Structures

Section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 et seq.); the National Park Service's Director's Order-28 Cultural Resource Management Guideline; and NPS Management Policies 2006 require the consideration of impacts on historic properties that are listed or eligible to be listed in the National Register of Historic Places. The National Register is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with State Historic Preservation Officers regarding the potential effects to properties listed on or eligible for the National Register of Historic Places. The Monument contains several historic structures including four buildings, the Monument road, and eight stone culverts built by the CCC; and a historic ladder on the Tower. None of the buildings or the ladder lie in or are directly adjacent to prairie dog town or the proposed exclusion area. The asphalt road with stone culverts does pass through prairie dog town, but because of the nature of the structures there are no expected impacts. If any unforeseen prairie dog management activity would potentially affect a historic structure, a separate Section 106 consultation would be initiated. Because the likelihood of impacts is not reasonably expected, the topic is dismissed from further analysis.

Cultural Landscapes

According to NPS-28: Cultural Resource Management Guideline, Chapter 7: Management of Cultural Landscapes, "a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built." Although several historic structures exist in the Monument, no historic structures are present within the project area, nor would there be any significant change in land use. Cultural areas would be maintained in all alternatives of this plan. Because the likelihood of impacts is not reasonably expected, the topic is dismissed from further analysis.

Ethnographic Resources

Per NPS-28, ethnographic resources are defined as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to Director's Order 28 (DO-28), Executive Order 13007, and NPS Management Policies 2006, the National Park Service must preserve and protect ethnographic resources.

According to DO-28, Devils Tower is a 'landscape' type of ethnographic resource. An ethnographic landscape is an area containing diverse natural and cultural resources that associated people define as part of their heritage. According to the 1997 Ethnographic Overview and Assessment of Devils Tower National Monument, Wyoming (Hanson 1997), Devils Tower National Monument contains several ethnographic resources identified by various associated tribes. Devils Tower, the geologic formation, is situated over ½ mile to the northwest of prairie dog town. None of the management strategies in this plan would diminish the ethnographic significance, value or use of the Monument in any manner. During tribal consultation, no concerns were expressed about the PDMP. Because the likelihood of impacts is not reasonably expected and no tribal concerns were expressed, the topic is dismissed from further analysis.

Museum Collections

According to Director's Order 24: Museum Collections, the National Park Service requires the consideration of impacts on museum collections and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, NPS museum collections. The Departmental Manual (411 DM 1.3) defines museum property (museum collections) as "an assemblage of museum objects collected according to some rational scheme and maintained so they can be preserved, studied, or interpreted for public benefit. Museum objects include prehistoric and historic objects, artifacts, works of art, archival documents [historical and scientific document collections as defined in the Departmental Museum Property Handbook, 411 DM Volume I, Appendix A, Section A.2.d.] and natural history specimens that are a part of museum collections. Museum property does not include those items necessary to display a collection such as exhibit cases, dioramas, special lighting, graphics, etc." (2:2 NPS Museum Handbook, Part I, 2003)

None of the alternatives in this plan would affect the Monument's collections. In 2008, the relocation of the Monument's museum collection from Devils Tower to Mount Rushmore was completed. There are no museum collections in the Monument, therefore the topic has been dismissed as an impact topic in this document.

Air Quality

Devils Tower National Monument is classified as a Class II area under the Clean Air Act of 1977. In a Class II area, moderate degradation of air quality is allowed. The Department of the Interior (DOI) has identified the Monument as possessing air quality-related values and resources worthy of being protected. Air quality is excellent in the area except during the fire season in the western United States, when smoke from distant fires contributes to regional haze. No action in the proposed PDMP would produce a significant amount of dust, smoke, or other air pollutants. The PDMP would not affect the baseline values of air quality. Because there would be no effects to air quality in the project area, this topic is dismissed from further analysis in this document.

Soundscape Management

In accordance with NPS Management Policies 2006 and Director's Order 47: Sound Preservation and Noise Management, an important component of the NPS mission is the preservation of natural soundscapes associated with national park units (NPS, 2006a). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with

the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. No management action in this plan would create unusual noise in the Monument. Because there would be no effects to the soundscape in the project area, this topic is dismissed from further analysis in this document.

Lightscape Management

In accordance with NPS Management Policies 2006, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light (NPS, 2006a). Devils Tower National Monument strives to limit the use of artificial outdoor lighting, using only what is necessary for basic safety. The Monument also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, in order to keep light on the intended subject and out of the night sky. No management action in this plan would produce additional night-time light outside the typical light requirements in the Monument. Because there would be no effects to lightscapes in the project area, this topic is dismissed from further analysis in this document.

Socioeconomics

An analysis of the socioeconomics examines potential impacts on the human environment including land use, economics, and demographics. The proposed actions for management of prairie dogs in the Monument would not change local or regional land use, nor cause an economic or demographic impact on the local or regional areas. Because the impacts of all alternatives presented in this Plan/EA would be negligible, this topic is dismissed from further analysis.

Prime and Unique Farmland

In August 1980, the Council on Environmental Quality (CEQ) directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the Natural Resource Conservation Service, U.S. Department of Agriculture. Prime or unique farmland is defined as soil that produces general crops, such as common foods, forage, fiber, and oil seed. Unique farmland produces specialty crops, such as fruits, vegetables, and nuts. According to the Natural Resource Conservation Service, there are no prime or unique farmlands in Devils Tower National Monument. Because prime and unique farmland does not exist in the project area the topic has been dismissed from further analysis in this document.

Indian Trust Resources

President Clinton's April 29, 1994, "Memorandum for the Heads of Executive Departments and Agencies" directs that "Each executive department and agency shall assess the impact of federal government plans, projects, programs, and activities on Tribal trust resources and assure that Tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities." In addition, order 3175 (Secretary of the Interior, November 8, 1993) states the following: "The heads of bureaus and offices are responsible for being aware of the impact of their plans, projects, programs or activities on Indian trust resources. Bureaus and offices when engaged in the planning of any proposed

project or action will ensure that any anticipated effects on Indian trust resources are explicitly addressed in the planning, decision and operational documents. These documents should clearly state the rationale for the recommended decision and explain how the decision will be consistent with the Department's trust responsibilities." One definition of Indian trust resources is "those natural resources, either on or off Indian lands, retained by, or reserved by or for Indian tribes through treaties, statutes, judicial decisions, and Executive Orders, which are protected by a fiduciary [trust] obligation on the part of the United States" (subsection B, section 3, Secretarial Order 3206, Babbitt 6/5/1997). No lands or resources in Devils Tower National Monument are trust resources according to this definition. Because Indian trust resources do not exist in the project area the topic has been dismissed from further analysis in this document.

Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low income populations and communities. No alternative in the Plan/EA would have health or environmental effects on minorities (including American Indian tribes) or low-income populations or communities as defined in the Environmental Protection Agency's Environmental Justice Guidance (1998). Because there would be no effects to environmental justice in the project area, this topic is dismissed from further analysis in this document.

Climate Change and Sustainability

The effects of global climate change pose many issues for National Parks. Due to the many variables involved, and possible variables not yet defined, the long-term effects of global climate change are not fully understood. At this time, the main cause thought to contribute to global climate change is the emission of greenhouse gasses. The management of prairie dogs at Devils Tower National Monument would not cause any unusual increase in the emission of greenhouse gases or significant impact on global climate. Because the likelihood of impacts is not reasonably expected, the topic is dismissed from further analysis.

Traffic

Current visitation to the Monument impacts traffic only on the road linking Wyoming Highway 24 to the main Monument road (Wyoming Highway 110). None of the alternatives described would appreciably alter traffic on WY 24, so there would be no impact on state roads. Because there would be no effects to traffic in the project area, this topic is dismissed from further analysis in this document.

Chapter 2: Alternatives Considered

The alternatives presented in this document are the result of agency and public scoping input, and their impacts are analyzed in accordance with NEPA. All alternatives must be consistent with the purpose and significance of Devils Tower National Monument, and they must meet the purpose of and need for action, as well as the objectives of the plan. Twelve alternatives, and the no action alternative, were originally considered, ten of which were dismissed for various reasons.

The environmental assessment includes three alternatives: the No Action Alternative (Alternative A), a Passive Management approach (Alternative B), and the preferred alternative, an Adaptive Management approach (Alternative C). Under Alternative A, no change in management of prairie dogs would take place. The no action alternative is the baseline for analyzing impacts of the alternatives to manage the prairie dogs at Devils Tower National Monument.

2.1 Alternatives Carried Forward

Description of Management Strategies Used in 2.1 Alternatives Carried Forward

The following section describes the management strategies that may be included in an alternative of this plan. An alternative may use all or only a portion of the strategies described. Each alternative will identify the specific strategies it would utilize.

Live-Trapping and Relocation:

This control method could be used for animals encroaching on Monument facilities, assuming a suitable relocation area has been identified and adequate staff is on hand to set and monitor traps throughout the day. Live-trapping prairie dogs and relocating to a willing taker outside the Monument, or donating them to the Black-footed Ferret Recovery Program (Contact: Black-footed Ferret Recovery Implementation Team, P.O. Box 190, Wellington, CO 80549) could reduce prairie dog populations in the Monument in locations where they are not desired. If suitable habitat for prairie dog introduction were located in Devils Tower National Monument, new prairie dog colonies could be established by relocating the animals to prepared sites at the discretion of the Monument superintendent once appropriate NEPA compliance has been completed. See guidelines for live trapping methods in Appendix E.

The Wyoming Game and Fish Department would be consulted prior to any relocation efforts so that necessary permits (Chapter 10 and 33) may be obtained. The Wyoming Game and Fish Commission must approve any relocation of black-tailed prairie dogs within and from outside the state of Wyoming. Approval is given on a case-by-case basis and under consultation with Wyoming Game and Fish permitting office and the regional biologist. If this management option is pursued, the Wyoming Game and Fish Directors Office would be contacted early in the process to get the relocation proposal on the WGF Commission agenda in a timely manner. See Appendix E for live trapping protocol from NPS.

Passive Relocation:

This control method could be used for animals encroaching on high-use visitor areas. A passive prairie dog relocation method where prairie dogs are moved without physically handling them would be employed. When prairie dogs develop burrows outside the allowed area, each burrow is closed by installing a one way wire door where prairie dogs can exit the burrow but cannot re-enter (see Appendix F for example). When the burrow is inactive for 72 hours, the burrow is sealed with a large rock and horizontal sub-surface barrier such as poultry wire, hardware mesh or plastic geo grid. The closing of burrows would encourage prairie dogs to relocate back into the town. Passive Relocation is best used in conjunction with other strategies that would prevent movement back into the area.

Physical barrier:

A physical barrier, either permanent or temporary, could be established between the prairie dog colony and campground, amphitheater, picnic area, sculpture and other areas as needed. Physical barriers are somewhat successful at maintaining or limiting prairie dog populations within certain areas (Witmer et al., 2008; Witmer and Hoffmann, 2002). Other studies have found some types of physical barriers to be ineffective at reducing recolonization rates of prairie dogs (Hygnstrom, 1995). The physical barriers should be set up before emergence of juvenile prairie dogs in early- to mid-May. The most commonly used physical barriers are vinyl fencing or privacy fencing but any and all viable alternatives would be considered including rock walls, erosion control fabric, etc. This barrier could serve as a control while a natural barrier of shrubs and tall grasses is established. Mowing could be limited or discontinued in areas to allow tall grasses to establish. Interpretive signs would be installed along the physical barrier to inform the public of the purpose of the barrier. Once vegetation is established the physical barrier could be removed.

For guidelines for establishing a physical barrier see guidelines developed by the Cities of Fort Collins and Boulder in Colorado (Appendix D). The type of barrier installed would be determined by the site location, success of previous exclusion attempts, and would not be limited to fabric, rock, fence, or other materials. The disturbed soil would be reseeded with native plants following installation of the barrier and any exotic species encountered would be removed during barrier installation according to NPS IPM guidelines.

Natural Barrier:

A vegetative buffer could be established between the prairie dog colony and the campground, amphitheater, picnic area, sculpture, and other areas as appropriate. Because prairie dogs are limited in their dispersal by habitat preferences, the presence of suitable soils, slope, and vegetation could control where prairie dog colonies are located on the landscape (NRCS, 2001). Natural vegetation barriers could be used to maintain prairie dog populations within a certain area (Witmer and Hoffmann, 2002). Since a vegetative barrier requires time for vegetation to establish, this would be done in conjunction with a permanent or temporary physical barrier. The physical barrier (see Physical Barrier) would be established to prevent prairie dog expansion into undesirable areas and to protect the vegetative buffer until vegetation reaches a size and density great enough to deter prairie dog use (potentially several years).

Transplants of native shrubs such as *Rosa arkansana* (prairie rose), *Rosa woodsii* (Wood's rose), or *Artemisia* spp. (sagebrush) and tall grasses such as *Achnatherum hymenoides* (Indian ricegrass), *Pascopyrum smithii* (western wheatgrass), *Pseudoroegneria spicata* (bluebunch wheatgrass), or *Andropogon gerardii* (big bluestem) would be planted in areas where future colony expansion is anticipated and would be undesirable (e.g. between prairie dog colony and the campground, amphitheater, and sculpture). Any exotic species encountered during planting of natural barrier would be removed according to NPS IPM guidelines. The vegetative buffer should be established at the maximum width possible given the constraints of the campground and trail location. If necessary for establishment, shrubs would be watered throughout the summer.

Modifications to trails, roads, and visitor-use areas (“modifications”):

Prairie dogs causing safety issues around trails, roads, and visitor-use areas could be managed by modifying those features. Modification can be made to eliminate tripping hazards created by burrows adjacent to paved trails or borrows made on dirt trails by adding a horizontal sub-surface barrier. Depending on the location and need, a barrier consisting of poultry wire, hardware mesh, or plastic geo grid could be placed horizontally, three to eight inches under the surface of the soil. The horizontal sub-surface barrier would prevent prairie dogs from burrowing next to or on trails. This method was successfully used to install the dirt path and viewing area around the Circle Sacred Smoke Sculpture in 2008. Gravel Pave² by Invisible Structures, a grid of plastic rings, was placed under the trail and viewing area. The sculpture trail and viewing area are still free of burrows. Another type of sub-surface barrier that could be used is EcoGrid/EcoRaster by Terraferm Enterprises (Debra Frye, Personal Communication).

Curbing could be placed along the edge of trails or roads to prevent prairie dog burrow debris from spilling over onto surface and prevent visitors stepping off the trail into a burrow. Areas or burrows on, or directly adjacent to, trails or roads could be covered or filled with like material (rock, asphalt, concrete) as a repair or buffer. A low barrier or wall could be placed along trails, roads, and pullouts to prevent visitors from walking into prairie dog town, limit interaction between visitors and prairie dogs, prevent tripping, and reduce maintenance. A vertical sub-surface mesh could be buried four to six feet deep along trails, barriers, structures and roads to prevent burrowing under and undermining features. This would most likely be done when the feature was being installed or renovated.

Lethal Control for Reduction or Eradication:

Nuisance and pest animals would be controlled in limited or localized situations where a problem exists because of conflicts with human health and safety, property, natural features, cultural resources, or Monument facilities or operations. Lethal control could be used to remove prairie dogs from areas where these conflicts exist.

In accordance with NPS IPM methodology, this plan would emphasize prevention of pest problems, and would consider lethal applications only when nonlethal controls

are ineffective or impractical. In such circumstances, lethal control could be used where immediate removal is needed, and as a short-term resolution while longer-term solutions (e.g. natural or physical visual barriers) are being put in place. Lethal control could be used at Devils Tower to prevent the encroachment of prairie dog colonies into areas utilized to meet other Monument goals, such as the campground, amphitheater, picnic area, and sculpture, and to prevent excessive contact between visitors and prairie dogs.

When encroachment into these areas occurs, lethal control could be used following the protocols outlined below.

Gas cartridges are incendiary devices designed to give off carbon monoxide when ignited. They are specifically made for use in rodent burrows (Gas Cartridge – EPA Reg. No. 56228-2). These are most effective when the ground moisture is high, such as in the spring or after soaking precipitation. Care should be used during dry weather and vegetation as the gas cartridges can present a fire hazard. Gas cartridges are also non-selective, and can kill any non-target species in the burrow. The use of gas cartridges must be approved through the Integrated Pest Management process and requires an annual Pesticide Use Proposal (PUP). All NPS staff involved in the application of fumigants would follow all label directions and the appropriate Job Hazard Analysis, and other safety considerations would be reviewed and adhered to. Cartridges can be obtained through Animal and Plant Health and Inspection Services (APHIS) wildlife control offices. Hygnstrom et al. (2002) and Virchow et al. (2002) provides additional information on the use of gas cartridges for prairie dog control.

Due to the limited number of animals needing control and the proximity to high-use visitor areas, the preferred method of lethal control for use at Devils Tower is fumigation with gas cartridges (Chase, M. personal communication, March 24, 2013). Gas cartridges are recommended as the most efficient for a small number of burrows (less than 25) and the safest around humans and pets.

Zinc Phosphide

Zinc phosphide is a common rodenticide and has been in use since the 1940's. Typical mode of use is in the form of poisoned bait or poisoned oats. The poisoned bait/oats are placed in the entrance of the prairie dog burrows. When consumed, the zinc phosphide reacts with moisture and acid in the stomach to form toxic phosphine gas. Zinc phosphide poisoned bait/oats must be ingested to become toxic. Because the toxicity comes from the phosphine gas, bio-accumulation and secondary poisoning does not occur, thereby protecting predator species. Zinc phosphide is toxic to humans and other animals. The strong garlic-like odor of the chemical typically repels other animals, but is attractive to rodents. Zinc phosphide rodenticides have an added emetic to causes vomiting in case they are accidentally ingested by humans or other non-target animals. However it is still effective against rodents because they lack the ability to vomit. Zinc phosphide has no

residual environmental effects. It is expected to degrade in soil within two weeks and has low soil motility.

Zinc phosphide is labeled as a Restricted Use pesticide due to its hazard to non-target species, most notably birds. Applicators would be licensed pesticide applicators and mitigations would be in place to reduce the hazards to non-target species and visitors.

The use of zinc phosphide must be approved through the Integrated Pest Management process and requires an annual Pesticide Use Proposal (PUP). All NPS staff involved in the application of zinc phosphide would follow all label directions and the appropriate Job Hazard Analysis and other safety considerations would be reviewed and adhered to. In accordance with IPM methodology, this plan would emphasize prevention of pest problems and would consider pesticide applications only when nonchemical controls are ineffective or impractical.

See Appendix G: Zinc Phosphide for more information on use, storage and disposal.

Alternative A: No Action

The No Action alternative describes what is currently being done to manage prairie dogs in the Monument. In 2000, live-trapping was approved in Devils Tower National Monument's Environmental Assessment for the Control of Black-tailed Prairie Dogs. Under this alternative, live-trapping is the only approved method for controlling prairie dog activity in high-use visitor areas. There are currently no standard operating procedures for management of or response to plague in the Monument.

Monitoring and Record Keeping

Prairie Dog Population Monitoring: Devils Tower National Monument currently monitors black-tailed prairie dogs by measuring annual prairie dog colony acreage and using weekly visual counts of prairie dog density throughout the summer. Annual monitoring of the prairie dog colony would continue to determine the occupied acreage and estimate general density of the Monument's prairie dog population. Visual counts of prairie dog density would be done during periods of high prairie dog activity by walking through the colony and counting visible prairie dogs. The occupied acreage of the colony would be monitored annually by mapping the boundary of the colony based on clipped vegetation lines several times throughout the summer. An annual report would be kept on file in the resource management office detailing population counts and total acreage.

Flea Monitoring: There would be no procedures in place for monitoring of fleas or plague. In the past fleas in the Monument have not been monitored for plague. From 2009-2012, as part of a multi-park research study, the University of South Dakota monitored fleas within the Monument. Monitoring as part of the study would continue through 2013. After 2013, there are no plans to continue the monitoring of fleas in the Monument.

Research: Research opportunities for studying prairie dogs in the Monument would continue to be encouraged and would occur on a funding available basis. Issuance of permits and ensuring permit compliance would continue to occur.

Record Keeping and Follow Up: An annual report detailing population counts and total acreage would be kept on file in the resource management office.

Decision Making

Decisions would be made at the discretion of Monument managers. Decisions would be made on a case-by-case basis based on good judgment, applicable law, regulations, best management practices, and approved management strategies.

Human Health and Safety

Trails would be periodically cleared of prairie dog burrow debris. Developed and undeveloped areas may be closed if human health and safety is threatened.

Plague Management

There would be no standard operation procedures in place for the management of or response to plague within the Monument.

Reestablishment

There would be no plans in place for reestablishment of the prairie dog colony in the event of colony collapse or elimination by disease.

Interpretation and Education

Current interpretation and education programs would continue. Prairie dog crossing signs would be posted along the entrance road to alert vehicles to slow down near the prairie dog colony to reduce prairie dog mortality. Interpretive signage along the entrance road would remain in place. Informational pamphlets and signs would be available at pull outs in prairie dog town explaining the ecological role of the prairie dog and indicating potential hazards associated with prairie dog towns (i.e. biting, disease, stepping in burrows, rattle snakes, spiders, and feeding prairie dogs human foods). Information would also be provided through The Tower Columns (Monument newspaper), the pamphlet/map given to all visitors at arrival, and ranger interpretive programs.

Management Strategies

- **Live-Trapping and Relocation:** Trapping prairie dogs and moving them to locations in the Monument or approved areas outside the Monument.

For more information see page 22 – Description of Management Strategies Used in 2.1, Alternatives Carried Forward.

Actions Common to Both Alternative B & C

This section describes actions that would take place in both action alternatives; Alternative B Passive Management and Alternative C Adaptive Management. Both alternatives would have the same key components and differ only in their management strategies. Alternative

B Passive Management would involve completely passive management strategies, using passive relocation and barriers, to redirect prairie dogs from the exclusion area to the allowable areas. Alternative C Adaptive Management would include passive management, live trapping and lethal control. Actions common to both include:

Monitoring, Adaptation, and Record Keeping

The key to successful implementation of this Plan/EA is adaptive management. Prairie dog management calls for the use of a number of different treatment methods to effectively deal with this species. Adaptive management means that staff would monitor the populations (i.e. numbers, locations, and effectiveness of treatments) and allow for flexibility in adjusting our integrated treatments to respond to changing conditions. Adjustments may include changing the preferred treatment method, treatment location, timing or frequency of treatments to effectively deal with the pest species, or the need to treat pest species in a location not currently affected. It also allows for the use of new treatment methods or materials not currently available. Adaptation of this plan would allow for the adoption of new methods that become available and are better suited to a situation than those currently recognized. Adjustments and adaptations could be made if the effects remain similar to or less than those described in this document.

For the purposes of this Plan/EA, adaptive management includes the following:

- The use of strategies that may not be specifically listed in the proposed action but are approved for use by the NPS and have similar environmental effects to strategies analyzed in this assessment.
- If prescribed management fails to result in desired outcomes, alternative strategies would be developed and management would be adapted until the desired conditions are achieved. New alternative strategies would be reviewed on a site-specific and case-by-case basis. If it is demonstrated through analysis that the environmental impacts of a new approach fall outside the impacts as disclosed in this document, then additional environmental and cultural analysis would be undertaken under NEPA and §106.
- Timing of treatments may be adjusted to allow for maximum effectiveness, protection of non-target species, and to minimize effects on visitor use and experience.

Through continued monitoring, adaptive management, and education, prairie dog management would be conducted in a proactive and responsible manner. This approach is interdisciplinary and uses a full range of available methods including education, prevention, and adaptive land management.

Prairie Dog Population Monitoring: Annual monitoring of the Devils Tower prairie dog colony would take place to determine the occupied acreage and estimate general density of the Monument's prairie dog population. This would ensure that acreage level and population size are consistent with the objectives of the plan (described in the "Purpose and Need" section of this document). Devils Tower National Monument would monitor black-tailed prairie dogs by measuring annual prairie dog colony acreage and using weekly visual counts of prairie dog density throughout the summer. Visual counts of prairie dog density would be done during periods of high prairie dog activity by walking through the colony and counting visible prairie dogs. The occupied acreage of the colony is monitored annually by mapping the boundary of the colony based on clipped vegetation lines several times throughout the summer.

Flea Monitoring: In addition to the above monitoring of prairie dog populations, flea monitoring and collection would occur following the protocols established in Appendix B if at any point during the year a significant reduction in prairie dog density is noted or dead prairie dogs are found. If at any point an outbreak of sylvatic plague is suspected, the appropriate authorities would be notified and the appropriate actions taken (Appendix B and C).

Management Effects Monitoring: Monitoring prior to and following a management action would be completed to determine the effectiveness of the action. This monitoring needs to be appropriate for the management action taken. For example, vegetation transects to determine plant density or other parameters may be done if a vegetative barrier is developed to control prairie dog movements, as well as monitoring prairie dog presence and or densities on either side of the barrier.

Record Keeping and Follow Up: Management actions conducted under this plan would be fully documented as to methods used and effects on prairie dogs and their habitat. Completed reports would be kept on file in the Resource Management files. Examples: annual reports to provide monitoring data on prairie dog occupation, population level, flea sampling, etc.; a report documenting passive management efforts; reports documenting plague detection and associated management actions taken.

Management actions would be evaluated and critiqued by participants, Devils Tower National Monument Natural Resource personnel and others (researchers, biologists, etc.) as needed, for improving management strategies and procedures. Examples: analysis of monitoring data to evaluate relocation and reintroduction efforts; assembling data and information on actions taken during a plague outbreak to review and determine if more effective or efficient actions could be recommended for the future.

The Resource Management Division would be responsible for preparing and submitting annual summary reports for prairie dog management activities for the year, and for updating or modifying approved strategies as appropriate. Review of the Management Plan may be conducted on an annual basis and would be conducted by the Monument Management Team with employee input encouraged. Major review and changes with NEPA compliance would be carried out every 5-10 years or when environmental conditions change significantly from when the plan was first approved. Other agencies and the public would be sent copies of the Management Plan for review, when the major review process is undertaken, for their evaluation and comments. Comments and suggestions received would be considered and substantive comments would be incorporated into the Management Plan as appropriate.

Research: Research opportunities for studying prairie dogs in the Monument will continue to be encouraged and would occur on a funding available basis. Issuance of permits and ensuring permit compliance would continue to occur.

Decision Making

Decisions would be made on a case-by-case basis based on good judgment, applicable law, regulations, best management practices, and approved management strategies.

A decision-making tool would be utilized based on triggers and appropriate actions for those triggers. See Prairie Dog Management Decision Making Tool, Appendix A. A decision-making flow chart would be used for plague monitoring and management, see Appendix C, section VII.

Human Health and Safety

In the short term, trails would be periodically cleared of debris from prairie dog burrowing. High-use visitor areas would be closed if prairie dog activity is considered hazardous to public safety. In the long term, trails and high-use visitor areas would be improved by curbing, horizontal sub surface barriers, or other means to reduce hazards to the public. A bait-delivered oral vaccine for prairie dogs has had great success in laboratory settings and is currently being tested for efficacy in the field. If a vaccine is approved, it could be utilized in the Monument to protect wildlife and the public from the threat of a plague outbreak.

Plague Management

A bait-delivered oral vaccine for prairie dogs is currently being tested for efficacy in the field. If a vaccine is approved, it could be utilized in the Monument to protect wildlife from the threat of a plague outbreak. In lieu of a vaccine, plague can be managed through standard operating procedures. Plague procedures in this document identify standard operating procedures for collection of biological samples, treatment of prairie dog colonies with pesticide, notification of cooperating agencies, and posting warning and closure signs when outbreaks of sylvatic plague occur.

The standard operating procedures found in Appendix C include:

- I. Background
- II. Purpose and Need
- III. Monitoring the Black-tailed Prairie Dog Population and Occurrence of Fleas that Inhabit Prairie Dog Burrows
 - a. Black-tailed Prairie Dog Monitoring
 - b. Flea Monitoring
- IV. If an Outbreak of Plague is Suspected: Collecting, Handling, Shipping Prairie Dogs
 - a. Black-tailed Prairie Dog Sample Collection
 - b. Flea Sample Collection
 - c. Burrow Dusting Protocol
 - d. Communication Protocol
- V. Detection Determination
 - a. If Plague IS NOT Detected
 - b. If Plague IS Detected
- VI. Literature Cited
- VII. Plague SOP Flow Chart
- VIII. Material Safety Data Sheet – Deltamethrin
- IX. Prairie Dog Mortality/Flea Collection Data Sheet
- X. Three Sample Signs for Posting in Areas of Plague Detection
- XI. Sample Press Release

Re-establishment

If the black-tailed prairie dog colony at Devils Tower National Monument were to collapse or be eliminated by disease, reintroduction would be used to re-establish prairie dogs within the existing prairie dog colony boundaries. Re-establishment would be subject to funding and approval by the state of Wyoming.

The Wyoming Game and Fish Department would be consulted prior to any reestablishment efforts so that permits (Chapter 10 and 33) may be obtained. The Wyoming Game and Fish Commission must approve any reintroduction of black-tailed prairie dogs within the state of Wyoming. Approval is given on a case-by-case basis and under consultation with Wyoming Game and Fish permitting office and the regional biologist. If this management option is pursued, the Wyoming Game and Fish Directors Office would be contacted early in the process to get the reestablishment proposal on the WGF Commission agenda in a timely manner.

The art and science of such reintroduction continues to evolve (Bly-Honness et al., 2004; Long et al., 2006). Some studies have shown that the more individuals relocated, the higher the probability of success (Robinette 1995). The best techniques to date, based on Long et al. (2006), are:

1. Capture prairie dogs between late June and mid-September using wire mesh live traps. Place the traps on level ground within 1-2 yards of the burrow entrance and bait them with horse sweet feed, mixed grain, or whole oats. Check traps several times per day (more frequently in hot, sunny weather or during snow or cold rain; overheating in hot weather is the most common cause of prairie dog mortality during live trapping). The source population should have as high a prairie dog density as possible. Colonies that have been little disturbed by poisoning or trapping should be favored. Note that live trapping is easiest on those colonies (portions of colonies) that have little or low-quality forage. (Long et al. 2006). Transplant success may be enhanced by relocating as many family members as possible (Shier 2004, as cited by Long et al. 2006).
2. Reintroduction should involve 60-100 prairie dogs, for which ages and sexes approximate natural conditions (i.e. more adults than juveniles and more females than males).
3. Consider dusting the prairie dogs while they are in the live traps with insecticide dust such as carbaryl or permethrin to kill fleas.
4. Transport prairie dogs in holding cages, such as "Havahart" rabbit hutches. Be sure to protect the prairie dogs from prolonged direct sunlight, precipitation, or high (>70F) or low (<40F) temperatures.
5. The new site should have had all tall vegetation removed from at least an area of 4-5 acres by mowing, grazing, or burning.
6. Post-release monitoring of prairie dogs should be implemented.

Interpretation and Education

Interpretive signs and pamphlets would be evaluated on a regular basis to determine the need for updating information. Prairie dog crossing signs would be posted along the entrance road to alert vehicles to slow down near the prairie dog colony to reduce prairie dog mortality. Additionally, new signs indicating human health and safety hazards associated with prairie dogs using a One Health message would be implemented both at

the pullouts on the entrance road and where the trails around prairie dog colony come into the visitor-use areas. Information would be provided indicating potential hazards associated with prairie dog towns (i.e. biting, plague, stepping in burrows, rattle snakes, spiders, and feeding prairie dogs human foods).

Interpretive signage along the entrance road would remain in place. Interpretive information on prairie dogs' function in the ecosystem, the management policies and plans regarding prairie dog management actions, and prairie dog management issues (e.g. human health concerns and population dynamics) would be provided to the public through The Tower Columns (Monument newspaper), the pamphlet/map given to all visitors at arrival, and ranger interpretive programs.

Individuals who may be potentially affected by prairie dog management actions (adjacent land owners, Tribal members, other state and federal agencies) would be notified of such activities.

The Standard Operating Procedure for Plague Outbreak (Appendix C) provides guidelines on providing accurate and timely information dispersal through public notices or to news media, particularly during plague occurrences.

Alternative B: Passive Management

This alternative would involve completely passive measures, using passive relocation and barriers, to redirect prairie dogs from the exclusion area to the allowable areas. This alternative does not include live trapping or lethal control. In addition, the Passive Management Alternative would include all actions in Actions Common to Both Alternative B & C.

Management Strategies for Alternative B: Passive Management

- **Passive Relocation:** The use of wire gates placed on prairie dog burrows to allow prairie dogs to exit the burrow, but not reenter, encouraging them to move into allowable areas.
- **Physical barrier:** Use of barriers made of wood, rock, cloth or other materials to limit prairie dog access to restricted areas.
- **Natural Barrier:** Planting vegetation to limit prairie dog access to restricted areas.
- **Modifications to trails and visitor-use areas:** Making changes to trails such as curbing and sub-surface barriers to reduce hazards to visitors.

For more information see page 22 – Description of Management Strategies Used in 2.1, Alternatives Carried Forward.

Alternative C: Adaptive Management

No one method of control is an effective means to accomplish all the objectives laid out in the proposed prairie dog management plan. As the prairie dogs react to management action, the methods of control would need to adapt to fit the changing conditions.

Therefore, the Adaptive Management alternative would integrate several methods to achieve various objectives and enable management personnel to adapt management efforts to accommodate for changing situations. The Adaptive Management alternative utilizes all actions in Actions Common to Both Alternative B & C and all management strategies, including live trapping and lethal control. The only difference between Alternatives B and C is the inclusion of live trapping and lethal control in Alternative C. The least invasive and most ecologically sound methods would be applied according to the level of control needed.

Management Strategies for Alternative C: Adaptive Management

- **Passive Relocation:** The use of wire gates placed on prairie dog burrows to allow prairie dogs to exit the burrow, but not reenter, encourages them to move into allowable areas
- **Physical barrier:** Use of barriers made of wood, rock, cloth or other materials to limit prairie dog access to restricted areas.
- **Natural Barrier:** Planting vegetation to limit prairie dog access to restricted areas.
- **Modifications to trails and visitor-use areas:** Making changes to trails such as curbing and sub-surface barriers to reduce hazards to visitors.
- **Live-Trapping and Relocation:** Trapping prairie dogs and moving them to locations in the Monument or approved areas outside the Monument.
- **Lethal Control for Reduction or Eradication:** Use of carbon monoxide cartridges or zinc phosphide, then close prairie dog burrows.

For more information see page 22 – Description of Management Strategies Used in 2.1, Alternatives Carried Forward.

2.2 Mitigation Measures

The following mitigation measures have been developed to minimize the degree and severity of adverse effects, and would be implemented during management under the action alternative, as needed:

- All construction or use of methods described above would be done in a manner to minimize soil compaction and topsoil removal. Soil disturbance within the proposed PDMP would be minor, involving closing prairie dog burrows in high-use visitor areas, installing barriers, and modifying existing features. Most projects within the

proposed plan would be in previously disturbed areas. Any disturbance would be rehabilitated upon completion of the projects.

- The use of geo grid, poultry wire, or other ground barriers would only be used in high-use visitor areas if prairie dog burrows would, or have the potential to, impact visitor safety or threaten infrastructure.
- During the installation of new infrastructure or renovation of existing infrastructure, the installation of ground barriers and other modifications would be done in conjunction with the installation or renovation of the feature.
- To reduce compaction and disturbance, vehicles and equipment would be parked on paved surfaces. Off road vehicle use, including UTVs, would be utilized only when necessary and when no other alternatives are available. Low weight vehicles would be preferred to higher weight vehicles.
- To minimize possible petrochemical leaks, all vehicles and equipment would be inspected and repaired as needed, prior to use in the project area.
- Fugitive dust generated during construction or management activity would be controlled by spraying water on the site if necessary.
- Vegetation displaced, disturbed, or compacted within the proposed PDMP would be restored. Disturbed areas would be reseeded as appropriate and de-compacted utilizing hand tools and, if necessary, agricultural implements to facilitate the revegetation process. No trees would need to be removed in the PDMP.
- For all projects, equipment and vehicles used in the project area would be washed prior to work to prevent the spread of invasive species.
- Any exotic species encountered during projects would be removed according to NPS IPM guidelines. Disturbed areas would be reseeded to prevent exotic species from establishing the site.
- All seed mix used for revegetation would be certified weed free, contain only native species of grasses and forbs, and be approved by the Chief of Resources.
- All vegetative barriers would be comprised of native species and would be approved by Chief of Resource Management.
- To minimize the potential for impacts to Monument visitors, when feasible, prairie dog management would be conducted during times of lowest visitation, most likely early morning, evening or overnight.
- To reduce the threat to non-target species, zinc phosphide rodenticide used in the Monument would contain an emetic. Bait/oats would be placed inside the burrow. Bait/oats would not be applied in a broadcast fashion or applied to barren soil.

- To prevent the overuse of pesticides and help protect non-target species, if zinc phosphide oats are used, burrows would be pre-baited with non-toxic oats to ensure prairie dogs are accepting of oats. If the non-toxic oats are not accepted by prairie dogs, zinc phosphide oats would not be applied.
- Before applying toxic oats, applicators would determine the potential for exposing non-target organisms. Applicators would pre-bait with non-toxic oats and conduct daily observations prior to applying toxic bait. Applicators would not apply toxic oats if non-target species are observed to be feeding on pre-bait.
- Areas treated with zinc phosphide would be closed to visitor use during treatment and remain closed until all remaining bait is removed.
- Under all aspects of the plan, if unknown archeological resources were unearthed at any time during ground disturbing activities, all activities would be suspended in that immediate area until NPS personnel could assess the find. After an assessment, and consultation with the State Historic Preservation Officer and Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13, Post Review Discoveries, management recommendations would be made regarding whether the activities would be allowed to resume. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 would be followed.
- While managing exotic plants in the project area: 1) physical disturbance would be avoided; 2) some mechanical treatments such as tilling would not be used; 3) pesticides would be used only if there is no other alternative; 4) only low potential toxicity pesticides would be used; 5) herbicides that do not readily break down in the soil would not be used; and 6) UTVs would avoid physically disturbing colonies.
- To prevent soil erosion, standard erosion control measures such as silt fences and sand bags would be used when necessary.

2.3 Alternatives Considered and Dismissed

Alternatives were developed based on the results of internal and external scoping. Alternatives are strategies to meet the purpose, objective and needs of the PDMP. The following section discusses those alternatives considered, but dismissed from further analysis. This discussion also includes an explanation of why these alternatives did not warrant additional analysis. These alternatives, strategies, and issues were eliminated from detailed study because of one or more of the following criteria:

- (a) technical or economic infeasibility.
- (b) inability to meet project objectives or resolve need.
- (c) duplication with other, less environmentally damaging or less expensive alternatives.
- (d) conflict with an up-to-date and valid park plan, statement of purpose and significance, or other policy, such that a major change in the plan or policy would be needed to implement.
- (e) too great an environmental impact.

Flushing Unit:

A unit comprised of a water tank, pump, soapy water and hose would be used to flush out prairie dogs from their burrows in high-use visitor areas. The management team was unable to find documented results. Dismissed: (b) inability to meet project objectives or resolve need.

Using Vehicle Exhaust:

Connecting a hose to the exhaust pipe of a NPS vehicle would be used to gas prairie dogs in high-use visitor areas. The management team determined there would be low probability of gaining Institutional Animal Care and Use Committee (IACUC) and public approval. Dismissed: (a) technical or economic infeasibility; (b) inability to meet project objectives or resolve need.

Installing utility poles for birds of prey:

Install utility type poles around prairie dog town for birds of prey to perch on, increasing predation on prairie dogs. The prairie dog town at Devils Tower has trees on all sides of ample height and distance to provide sufficient perching sites for raptors. In addition, predators would not focus control in high-use visitor areas. Dismissed: (b) inability to meet project objectives or resolve need; (c) duplication with other, less environmentally damaging or less expensive alternatives.

Introduce black-footed ferrets:

Black-footed ferrets could be introduced into the prairie dog colony at Devils Tower National Monument to help control the prairie dog population. Black-footed ferret populations may require up to 10,000 acres of prairie dog colony. An area of several thousand acres may be considered for reintroduction. Devils Tower National Monument contains only 40 acres of prairie dogs and is much too small to support black-footed ferrets (Licht, D., personal communication, October, 2009). In addition, ferrets would not focus control in high-use visitor areas. Dismissed: (a) technical or economic infeasibility; (b) inability to meet project objectives or resolve need.

Introduce predators such as badgers:

Predators could be introduced into the prairie dog colony at Devils Tower National Monument to help control the prairie dog population. Badgers are already intermittent residents at the Monument, as are other predators. In addition, predators would not focus control in high-use visitor areas. Dismissed: (c) duplication with other, less environmentally damaging or less expensive alternatives; (b) inability to meet project objectives or resolve need.

Permitted hunting of Prairie Dogs:

A permit system for hunting of prairie dogs could be established in the Monument to control the prairie dog population. The 40 acre prairie dog town is bordered by a hiking trail on all four sides, the campground, picnic area, and Monument road. Given the small size (40 acres) of the colony, hunting would be unsafe. In addition, hunting is presently not allowed in the Monument. Dismissed: (d) conflict with an up-to-date and valid park plan, statement of purpose and significance, or other policy, such that a major change in the plan or policy would be needed to implement.

Physical and Natural Barriers Alone

See Description of Management Strategies Used in 2.1 Alternatives Carried Forward. Barriers alone would not provide a means to remove prairie dogs already occupying high-use visitor areas or remove prairie dogs that subsequently breach barriers and occupy high-use visitor areas. Dismissed: (b) inability to meet project objectives or resolve need.

Live-Trapping and Relocation Only

See Description of Management Strategies Used in 2.1 Alternatives Carried Forward. Past live-trapping operations in the Monument were not successful in all locations and situations. Live-trapping can have a high re-occupancy rate, can take a considerable amount of time and requires a dedicated staffing level not always achievable. Live-trapping does not prevent prairie dog movement into high-use visitor areas. Dismissed: (a) technical or economic infeasibility, (b) inability to meet project objectives or resolve need, (c) duplication with other, less environmentally damaging or less expensive alternatives.

Lethal Control for Reduction or Eradication Only

See Description of Management Strategies Used in 2.1 Alternatives Carried Forward. Lethal Control can have a high re-occupancy rate and does not prevent prairie dog movement into high-use visitor areas. Dismissed: (b) inability to meet project objectives or resolve need.

2.4 Alternative Summaries

Table 1 Compares alternative A, B and C by each element of management. Alternatives B and C would have similar key components and differ only in their management strategies. Alternative B would involve completely passive management strategies while Alternative C would include passive management, live trapping and lethal control. Alternative A describes no change in management.

Table 1 – Summary of alternative by Management Elements

Management Elements	Alternative A No Action	Alternative B Passive Management	Alternative C Adaptive Management
Monitoring and Record Keeping	Prairie dog population monitoring would continue with an annual report kept on file.	Prairie dog population monitoring would continue with protocols in place for observed die off. Flea and plague monitoring would occur following protocol outlined in Appendix B. Management actions would be monitored for efficacy. An annual report would be kept on the population and would detail all management activity and effects for the year.	
Decision Making	Decisions would be made at the discretion of Monument managers.	A decision-making tool would be utilized based on triggers and appropriate actions for those triggers. See Prairie Dog Management Decision-making Tool, Appendix A. A decision-making flow chart would be used for plague monitoring and management. See	

Management Elements	Alternative A No Action	Alternative B Passive Management	Alternative C Adaptive Management
		Appendix C.	
Human Health and Safety	Trails would be cleared of debris; areas closed as necessary.	In the short term, trails would be periodically cleared of debris areas would be closed if necessary. In the long term, trails and high-use visitor areas would be improved by curbing, sub-surface barriers, or other means to reduce hazards to the public. If a prairie dog plague vaccine is approved, it could be utilized to protect human health from the threat of a plague outbreak.	
Plague Management	There would be no plans for plague management.	If a vaccine is approved, it could be utilized in the Monument to protect wildlife from the threat of a plague outbreak. In lieu of a vaccine, plague can be managed through collection of biological samples, treatment of prairie dog colonies with pesticide, notification of cooperating agencies, and posting warning and closure signs when outbreaks of sylvatic plague occur. See standard operating procedures in Appendix C.	
Reestablishment	There would be no plans for reestablishment.	If the black-tailed prairie dog colony at Devils Tower National Monument were to collapse or be eliminated by disease, populations could be re-establish within the existing prairie dog colony boundaries according to procedures in the Plan/EA.	
Interpretation and Education	Prairie dog crossing signs, interpretive signs on ecological role would remain. Warning signs for safety would remain and pamphlets would be available.	Prairie dog crossing signs and warning signs for safety would remain and pamphlets would be available. Additionally, new signs would be implemented using a One Health message, informing visitors on the ecological role of prairie dogs, plague, and human health and safety hazards associated with prairie dogs. One Health signs would be utilized at the pullouts on the entrance road and where the trails around prairie dog colony come into the high-use visitor areas.	
Management Strategies	Live-trapping	Passive Relocation Physical Barrier Natural Barrier Modifications	Passive Relocation Physical Barrier Natural Barrier Modifications Live Trapping Lethal Control

Table 2 summarizes the major components of Alternatives A, B and C, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative C meets each of the objectives identified for this project, while Alternatives A and B do not address all of the objectives.

Table 2 – Alternatives Summary and Extent to Which Each Alternative Meets Project Objectives

Project Objective	Alternative A Meets Project Objective?	Alternative B Meets Project Objective?	Alternative C Meets Project Objective?
Develop a Plan/EA that would provide the Monument with the strategies and compliance necessary to manage prairie dogs.	No. A prairie dog management plan would not be written. No compliance under an EA would be provided. Live-trapping would be the only management options.	No. A passive management approach would be adopted. Compliance would be gained under an EA. A decision-making tool based on triggers would be used. This alternative utilizes passive management strategies including relocation, barriers, and modifications to redirect prairie dogs from the exclusion area to the allowable areas. This would provide only a limited range of control methods that may not be effective for protecting people and resources in all situations.	Yes. An adaptive management plan would be adopted. Compliance would be gained under an EA. A decision-making tool based on triggers would be used. This alternative would integrate several methods including modifications, passive relocation, physical barriers, natural barriers, live-trapping, relocation, and lethal control to achieve various objectives and enable the Monument to adapt management efforts to accommodate for changing situations. The least invasive and most ecologically sound methods would be applied according to the level of control needed.

Project Objective	Alternative A Meets Project Objective?	Alternative B Meets Project Objective?	Alternative C Meets Project Objective?
Maintain a healthy prairie dog population with a distribution that would fulfill the ecological role of the species and allow other Monument objectives to be achieved.	No. No desired future conditions would be established. No procedures would be in place for reestablishment if the colony collapsed. Other Monument objectives would not be addressed.	Yes. Prairie dogs would be managed at a sustainable level with desired future conditions identified. Procedures would be in place for reintroduction of this keystone species in the event of colony collapse or eradication due to disease. Other Monument objectives, such as campground maintenance, would be achieved.	Yes. Prairie dogs would be managed at a sustainable level with desired future conditions established. Procedures would be in place for reintroduction of this keystone species in the event of colony collapse or eradication due to disease. Other Monument objectives, such as campground maintenance, would be achieved.
Reduce the probability, severity, and impact of a plague outbreak.	No. There would be no standard operating procedures for management of plague in the Monument.	Yes. Standard operating procedures for monitoring and management of plague would be developed and employed. If a prairie dog plague vaccine is approved it would be used at the Monument.	Yes. Standard operating procedures for monitoring and management of plague would be developed and employed. If a prairie dog plague vaccine is approved it would be used at the Monument.
Protect human health and safety and Monument infrastructure from hazards and damage associated with prairie dogs.	No. Interpretation and education would be limited. Modifications to existing visitor-use areas and infrastructure would not take place. Human health would not be addressed.	No. Interpretation and education would be expanded to include One Health and plague information. Modifications and plague management would help protect human health and safety. Control methods would be too limited to protect human health & safety and infrastructure in all situations.	Yes. Interpretation and education would be expanded to include One Health and plague information. Modifications and plague management would help protect human health and safety. A full selection of control methods would help protect human health & safety and infrastructure in all situations.

Table 3 summarizes the anticipated environmental impacts for Alternatives A, B and C. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 3 – Environmental Impact Summary by Alternative

Impact Topic	Alternative A No Action	Alternative B Passive Management	Alternative C Adaptive Management
Wildlife	Plague outbreaks are not covered which could increase the chance of rapid decline in prairie dog population and cascading effects in the ecosystem.	A sustainable population of prairie dogs would be maintained. Some relocation of prairie dogs would occur in high-use visitor areas with prairie dogs relocating to different areas of the Monument. Procedures would be in place for reintroduction.	A sustainable population of prairie dogs would be maintained. Some relocation or elimination of prairie dogs would occur in high-use visitor areas, but loss would likely be minimal with some prairie dogs relocating to different areas of the Monument. Procedures would be in place for reintroduction.
Visitor Use and Experience	No change in existing conditions. Hazards to visitors would increase.	Action would reduce prairie dog encroachment on some high-use areas such as the picnic area, campground, and amphitheater. Passive management may not be effective in all situations. Unsuccessful control areas may pose hazards to human health and safety.	Action would reduce prairie dog encroachment on high-use areas such as the picnic area, campground, and amphitheater. The reduction of prairie dogs in high-use areas would improve safety and reduce hazards to human health and safety.

Impact Topic	Alternative A No Action	Alternative B Passive Management	Alternative C Adaptive Management
Monument Operations	No change, maintenance time for trails and visitor-use areas would increase with possible area closures; infrastructure would be threatened.	In the short term, action may require a small increase in time spent monitoring and implementing the plan. In the long term the passive management would require less implementation. Infrastructure would be better protected and closure of visitor-use areas could be avoided. Control might not be effective in all visitor-use areas.	In the short term, action may require a small increase in time spent monitoring and implementing the plan. In the long term, Adaptive Management would require less implementation and provide more options for control. Infrastructure would be better protected and closure of visitor-use areas could be avoided. More options for control would lead to better Monument operations.

2.5 Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative.”

Both Alternative B (Passive Management) and Alternative C (Adaptive Management) would achieve the following: 1) provide for the management of a healthy prairie dog population as a keystone species; 2) have standard operating procedures in place for protecting prairie dogs from disease; 3) outline procedures for the reintroduction of prairie dogs in the event of a population collapse.

Alternative C: In addition to achieving the above, this alternative would cause the least amount of damage to the physical environment, and therefore is the environmentally preferable alternative. Alternative C provides for long-term sustainability and reduced disturbance. By providing more flexibility in management methods, this alternative would produce more immediate results, reducing immediate threats to infrastructure. By protecting infrastructure, this alternative would prevent significant disturbance to the environment resulting from infrastructure repairs.

Alternative B: With passive control measures, this alternative may cause more damage to the physical environment; therefore is not the environmentally preferable alternative.

Although this alternative would better protect individual prairie dogs, passive measures could take considerable time for control to be achieved. If infrastructure is in immediate jeopardy and damage occurs, the repairs to the infrastructure could cause significant disturbance to the environment and overall ecosystem.

Alternative A: The No Action alternative is not the environmentally preferable alternative, because it would not ensure an ecologically viable prairie dog population and a healthy ecosystem. This alternative would not allow for the management of prairie dogs as a keystone species, there would be no plans in place for monitoring and managing disease and there would be no plans for the reestablishment of the species should the population collapse.

2.6 Preferred Alternative

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Alternative C is the environmentally preferable alternative, better protects human health and safety, and better meets the other project objectives; therefore, it is also considered the NPS preferred alternative. For the remainder of the document, Alternative C will be referred to as the preferred alternative.

Chapter 3: Affected Environment

This chapter provides an overview of the current condition of the resources that could be impacted by this Plan/EA. Carried forward for analysis and described below are the topics of Wildlife, Visitor Use and Experience, and Monument Operations.

3.1 Wildlife

NPS Management Policies Section 4.4 and the NPS-77 Natural Resources Management Guideline state that the NPS will seek to perpetuate the native animal life as part of the natural ecosystem of parks. In regards to wildlife, NPS Management Policies Section 4.4 states the National Park Service will maintain as part of the natural ecosystems of parks all animals native to park ecosystems. The Service will successfully maintain native animals by: preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native animal populations and the communities and ecosystems in which they occur; restoring native animal populations in parks when they have been extirpated by past human-caused actions; and minimizing human impacts on native animals, populations, communities, and ecosystems, and the processes that sustain them.

The most common animals using or inhabiting Devils Tower National Monument are numerous insect species, prairie dogs, porcupine, white-tailed deer, mule deer, red squirrel, least chipmunk, coyotes, badgers, deer mouse, bats, mice, yellow-bellied racer, bullsnake, and prairie rattle snake; more than 100 species of birds with the most common breeding birds being wild turkey, mourning dove, hairy woodpecker, northern flicker, western wood-pewee, violet-green swallow, bluejay, black-capped chickadee, white-breasted nuthatch, red-breasted nuthatch, brown creeper, American robin, mountain bluebird, Townsend's solitaire, solitary vireo, yellow-rumped warbler, ovenbird, western tanager, chipping sparrow, dark-eyed junco, red crossbill, and pine siskin. Fences along the Monument boundary, development in the Monument, and the presence of visitors and employees interrupt wildlife habitat and alter wildlife movement. Of these factors, the fences used by private landowners to restrict movement of their cattle probably cause the greatest impact on wildlife by restricting their movement.

The black-tailed prairie dog is an integral element and keystone species of the mixed-grass prairie habitat at Devils Tower. Up to eighty-nine species of wildlife have been identified as being in some way associated with prairie dog colonies. The digging actions of prairie dogs contribute to enhancing soil structure, water filtration, and forb growth. Seeds and insects exposed by prairie dog grazing attract meadowlarks, lark buntings and other birds. Ungulate species seek out and take advantage of the highly nutritional vegetation created by prairie dogs continuously clipping it (Foster and Hygnstrom, 1990). Besides attracting ungulates, prairie dogs and their colonies also are used by a wide variety of wildlife species. A number of species prey on prairie dogs including badgers, hawks, golden eagles and snakes. Many species, such as the burrowing owl, utilize the burrows as habitat and nesting sites.

The prairie dog has become a conservation concern over the last 20 years because of dwindling populations and large complexes, lack of regulatory protection, plague, and habitat loss. The Wyoming National Diversity Database lists the black-tailed prairie dog as a G4/S2 species (WYNDD, 2010). The global rank of G4 indicates that black-tailed prairie

dogs are considered “apparently secure, although may be quite rare in parts of its range, especially at the periphery.” The state rank of S2 indicates that the black-tailed prairie dog is “imperiled because of rarity or because of factors making it vulnerable to extinction” within the state of Wyoming. Within the state of Wyoming, the Department of Game and Fish (WGFD) classifies black-tailed prairie dogs as a sensitive species (NSS3-2B) due to populations that have declined and vulnerable habitat, but lack of ongoing significant habitat loss.

The prairie dog population in the Monument has followed typical population trends with one die-off in the early 1990’s. The present population is estimated at 500 individuals. The prairie dog town covers approximately 40 acres with encroachment issues in the campground, picnic area, sculpture area, and amphitheater.

3.2 Visitor Use and Experience

According to NPS Management Policies 2006, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS, 2006a). The National Park Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, NPS will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. NPS Management Policies also state that scenic views and visual resources are considered highly valued associated characteristics that NPS should strive to protect (NPS, 2006a).

Devils Tower National Monument welcomes 400,000 visitors annually with an average visit of 2.4 hours. Most visitors to Devils Tower National Monument enjoy photographing the Tower, hiking area trails, camping, picnicking, and wildlife viewing (mainly in prairie dog town). Approximately 5,000 technical rock climbers scale the Tower each year. A large proportion of visitors walk the paved Tower Trail, the main access route to view the Tower. Only a small number of visitors hike the other trails, including the Joyner Ridge Trail and the Red Beds Trail. Camping is available in the Monument with 50 sites typically open from April through October.

The majority of visitation is focused in the area of the Tower and visitor center, which is one-half of a mile to the north-west of the prairie dog town. The prairie dog town is the second most popular visitor attraction in the Monument after the Tower formation itself. The main Monument road passes through prairie dog town with burrows on both sides of the road. Three paved pull out areas are provided on the south side of the road for visitors to safely observe the prairie dogs. The South Side Trail and Valley View Trail (both dirt) take visitors through prairie dog town. Several developed, high-use visitor areas border the prairie dog town. The campground borders the south edge of prairie dog town. The amphitheater is located on the south-west border of prairie dog town, providing visitors with interpretive programs through the summer. The picnic area is located on the south-west edge of prairie dog town, providing visitors with several outdoor picnic tables amongst the trees, a picnic pavilion, water, grills, and comfort stations. The Sacred Smoke sculpture and Peace Pole are on the western border of prairie dog town, providing visitors with an interpretive message about the sacredness of the Tower and the desire for peace among all nations.

Camping, picnicking, hiking, interpretive programs, and observing prairie dogs are a large part of visitor use at the Monument. The locations of these high-use areas bring people, infrastructure, and prairie dogs into close proximity. A healthy prairie dog population, as well as human health and safety, is necessary for a positive visitor experience.

3.3 Monument Operations

Monument operations include the vital processes that keep the Monument operating in an effective manner. The ability to maintain infrastructure and provide visitor services are key elements of Monument operations. Monument operations in the proposed prairie dog exclusion area include the campground, amphitheater, picnic area, sculpture area, overflow parking and all the utilities and infrastructure associated with those features. Any interference with these features can seriously disrupt Monument operations, keeping the Monument from meeting its mission.

Since the days of the Civilian Conservation Corps, when the Monument's facilities were constructed, visitation has increased twentyfold. Annual visitation over the past ten years has neared or exceeded 400,000. Nearly three fourths of the year's visitation occurs during June, July, and August. This creates a very noticeable high-use season.

NPS statistics show the five-year average annual use of the Monument's Belle Fourche campground at approximately 2,300 tents and 1,800 recreational vehicles, a total of 4,100 occupied campsites per year, or an estimated 14,000 campers. The campground includes 52 sites with 4 sites closed due to prairie dog encroachment. 48 sites remain open with elevated outdoor grills and picnic tables, 2 paved loop roads, 5 water spigots, and 2 comfort stations with drain fields. Utilities include overhead and buried electrical lines, buried water and septic lines and drain fields. The campground is open and maintained May through October weather permitting.

The concrete paved amphitheater includes bench seating for 150 visitors, a projection booth and screen, an interpretive wayside, and paved walkways to the campground and picnic area. There is also access to prairie dog town, the South Side Trail, and Valley View Trail. Amphitheater parking is located adjacent to the picnic area with paved parking for 30 vehicles. The main power supply is overhead with buried lines for walkway lighting. Prairie dog burrowing interferes with electrical infrastructure and creates trail maintenance and safety issues.

The picnic area includes a total of 43 picnic tables accommodating up to 250 people, water spigots, a comfort station and drain field. Amongst the trees, the area includes 22 dedicated outdoor picnic sites consisting of a concrete pad with picnic tables and elevated grills. The picnic area also includes a paved parking area with 20 spaces. Utilities include overhead and buried electrical lines, buried water and septic lines, and a drain field. Prairie dog encroachment interferes with picnic area use and human health and safety.

The main Monument road (State Highway 110) passes through prairie dog town with three observation pullouts. The pullouts contain information signs, interpretive waysides, and brochure boxes. Several roadway signs are also located in this section of highway.

The Monument's resource management division has one fulltime permanent employee and the Maintenance division has three fulltime permanent employees. The number of seasonal

employees varies from year to year with an average of five seasonal employees in each division. There are limited human resources available in the Monument. Cleaning debris from the paved amphitheater walkway requires daily attention; dirt must be removed by shovel and swept daily. When trapping is utilized to remove prairie dogs, it may take several weeks to accomplish the objective. Up to three traps per burrow maybe required. Depending on the number of burrows, it may take 2-3 employees 4-6 hours to initially set up the traps. Traps must be checked at least twice a day. At times, up to 50 burrows in the picnic area has required an extensive trapping effort, demanding 20 management hours or more a week. Without other strategies such as barriers to prevent re-entry, trapping has limited success in fully clearing an area. A high rate of re-entry requires constant management efforts. If prairie dogs cannot be controlled or removed in a developed visitor area, the area may be closed. A portion of the campground has been closed from time to time with four sites closest to the prairie dog town being closed for an extended period of time.

The ability to keep these facilities open and operational, and conserve human resource hours is critical for Monument operations.

Chapter 4: ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the proposed project. Topics carried forward and analyzed in this chapter include Wildlife, Visitor Use and Experience, and Monument Operations. Direct, indirect, and cumulative effects are analyzed for each topic. Potential impacts are described in terms of type, context, duration, and intensity.

4.1 Definitions

General definitions are defined below. More specific impact thresholds are provided for each resource at the beginning of each resource section.

Type describes the classification of the impact as beneficial or adverse, and direct or indirect:

- **Beneficial**: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
- **Adverse**: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
- **Direct**: An effect that is caused by an action and occurs in the same time and place.
- **Indirect**: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

Context describes the area or location in which the impact would occur; site-specific, local, regional, or broad?

Duration describes the length of time an effect would occur, either short-term or long-term:

- **Short-term** impacts generally last only during management action, and the resources resume their pre-action conditions following the action.
- **Long-term** impacts last beyond the management action, and the resources may not resume their pre-action conditions for a longer period of time following the action.

Intensity describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this Environmental Assessment.

4.2 Cumulative Effects

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of

what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are analyzed for all alternatives carried forward.

Cumulative impacts were determined by combining the impacts of the Preferred Alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Devils Tower National Monument and, if applicable, the surrounding region. The geographic scope for this analysis includes elements mostly within the Monument's boundaries, while the temporal scope includes projects within a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis, listed from past to future:

- **Development of Fire Management Plan, 2004:** The Monument's Fire Management Plan was completed in November 2004. One of the primary actions prescribed by the plan is the reduction of hazardous fuels around the Monument's boundary. The plan calls for mechanical treatment of fuels around historic structures and in the north area of the Tower, where fuel loads are currently too high to allow prescribed burns. Mechanical treatment would also occur at the landscape level to reduce fire behavior and limit mortality of ponderosa pine canopy trees. A goal of the plan is to reintroduce fire into the ecosystem at the Monument to mimic fire's historic role. Approximately 1,300 acres could be treated over the next ten years.
- **Exotic Vegetation Management Plan, 2005:** The Monument's Exotic Plant Management Plan was completed in 2005. The plan calls for the use of an IPM approach to control exotic plants at 13 parks, including Devils Tower. The NPS is mandated to preserve natural and cultural resources now and for future generations. IPM is a decision-making process that supports the NPS mission by coordinating knowledge of pest biology, the environment, and available technology to prevent unacceptable levels of pest damage using environmentally sound, cost-effective management strategies that pose the least possible risk to people, resources, and the environment. Currently, mechanical, biological, and chemical controls are being used at the Monument. Treatments are performed annually on exotic species where practical. Future work would focus on maintaining the already treated areas and addressing other high priority areas identified in a 2003 exotic vegetation-mapping project.
- **Installation of "Circle of Sacred Smoke" sculpture, 2008:** A marble sculpture, designed by world-renowned sculptor Junkyu Muto, was installed in the Monument in summer 2008. The purpose of the sculpture is to promote world peace and understanding. Seven related sculptures are destined to be installed at sites of significant religious meaning throughout the world. The first sculpture was installed in Vatican City in 2000, and the second in Bodhi Gaya, India, in 2005, near the Bodhi Tree, where the Buddha attained enlightenment. The area of disturbance as a result of the sculpture installation was less than ½ acre and the area is in the process of being rehabilitated with native seed distribution and native shrub and tree transplants. No additional sculpture installations are planned.
- **Replacing lateral water lines in Monument's administration, maintenance, and housing areas, 2009:** Old, outdated, and unreliable water lines were replaced in the

Monument's administration, maintenance, and housing areas in fall 2009. Trenches were dug to remove the old lines, and new lines were installed in the existing trenches. As a result, ground disturbance was limited to previously disturbed soil; all new lines are located in the same footprint of the lines being removed. The ground was leveled and contoured to match adjoining areas and reseeded with native seeds to minimize the potential for exotic vegetation to be introduced. The disturbed areas would be monitored for the presence of exotic vegetation and the necessary treatments would be employed to eliminate any exotics that may appear.

- **Overlay Tower Trail, 2009:** The Monument contracted a project to overlay the 1.3-mile Tower Trail encircling the Tower formation in summer 2009. This trail is the most heavily used trail within the Monument and was last resurfaced in 1991. This project provides a safer walking surface for employees and visitors until adequate funds are procured for a complete resurfacing. The scope of the project was the existing footprint of the paved Tower Trail. No widening or rerouting of the trail occurred.
- **Install new fiber-optic line to upgrade Monument phone system, 2010:** A new fiber-optic line was installed to upgrade the existing inadequate and unreliable analog phone system. The fiber-optic cable enters the Monument on the north side of the entrance road in the existing utility footprint, crosses to the south side just west of the Belle Fourche River bridge, and continues in the existing utility corridor until just west of the administration building. From this point, the fiber-optic line crosses the Monument road to the north and follows the existing sewer corridor to the visitor center and ranger station. A spade plow and underground boring machine was used to place the fiber-optic cable and sheathing to minimize ground disturbance and the potential for exotic vegetation to flourish. Since the sewer line was placed in this area approximately 10 years ago and areas of rock cleared to a depth of 10 feet, the need to bore or blast a path for the fiber optic was not necessary. Arteries were taken from the main fiber-optic line to Monument buildings to provide upgraded phone service to all work areas and offices. The route did not contain any cultural or historical sites.
- **Chip seal Monument roads, 2010:** All paved Monument roads were chip sealed as part of cyclic maintenance in August 2010. This includes the main Monument road as well as the roads to Monument housing, Monument picnic area, and the road to and through both loops of the Monument campground. No widening or rerouting of the roads was permitted and the project occurred within the existing footprint of the current road corridor. This project did not affect the historic nature of the road and provides a safer surface for Monument visitors and employees. This project would prolong the life of the roadway, thus delaying the need for a major rebuilding project and associated environmental impacts.
- **Upgrade Monument campground facilities, 2011–2013;** Monument campground facilities are scheduled to be upgraded and rehabilitated sometime between 2011 and 2013 as part of cyclic maintenance. Anticipated projects include putting new roofs on the existing comfort stations and replacing all inside fixtures. New plumbing and hydrants would be installed throughout the campground where existing features are currently located. All anticipated actions would occur within the footprint of the existing campground, as would work completed on buried infrastructure. All new buried

infrastructures would be installed in trenches where existing infrastructure is located. Additional gravel may be brought in to provide better RV and camper pads to prevent sites from becoming muddy and rutted, thus preventing erosion and other impacts to soil and vegetation.

- **Fence replacement, 2010–2013:** The Monument's boundary fence needs repair in many locations. Monument neighbors responsible for certain sections of boundary fence have attempted to keep these areas in serviceable condition to prevent livestock from trespassing onto Monument lands. However, certain sections of boundary fence for which the Monument is responsible need repair or need to be assessed as to their state of repair. By maintaining the boundary fence, impacts to soils and vegetation would be minimized, as would the introduction of invasive species transported by cattle. In fiscal years 2010–2013, the Monument plans to assess the condition of the boundary fence and make repairs as needed and as funds are available.

Impact Topics

4.3 Wildlife

Because the black-tailed prairie dog is an integral element and keystone species of the mixed-grass prairie ecosystem, many other wildlife populations are dependent on the prairie dog and their habitat modifications.

The thresholds for this impact assessment are as follows:

Intensity Level Definitions

- Negligible:** An action that could result in changes that would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population. Wildlife would not be affected or the effects would be at or below the level of detection, and would be short-term.
- Minor:** An action that could result in changes to wildlife populations that would be detectable, although the effects would be localized, and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
- Moderate:** An action that could result in changes to wildlife that would be readily detectable, long-term and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
- Major:** An action that could result in changes to wildlife that would be obvious, long-term, and would have substantial consequences to wildlife populations in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Impacts of Alternative A (No-Action Alternative)

Prairie Dog Monitoring:

Intrusion by individuals performing prairie dog monitoring may cause short-term, negligible disturbance to wildlife species. There may be some escape-flight response from wildlife during these activities, but this would produce negligible short-term adverse impacts in the form of unnecessary energy expenditures. The effects would be slight and of little consequence to wildlife populations. The impacts of intrusion on Monument wildlife would therefore be directly adverse, site-specific, short-term, and negligible.

Plague Monitoring and Management:

The lack of plague management could have a moderate negative effect on wildlife. If there were a plague outbreak, a catastrophic collapse of the prairie dog population could occur. This would have a cascading effect on other related wildlife in the ecosystem. Plague management could reduce or eliminate this threat. Therefore, the lack of plague management could indirectly have a moderate, adverse, long-term effect on the local wildlife populations.

Reestablishment:

In the event of prairie dog population collapse, there would be no procedures in place for the reestablishment of the species under this alternative. The reestablishment of prairie dogs in the Monument could have a beneficial effect on wildlife. Being the keystone species of the mixed-grass prairie, many other wildlife species in the area depend on the prairie dog. Not reestablishing the prairie dog population would have a long-term, moderate, direct, adverse effect on wildlife locally.

Interpretation and Education

Present interpretation and education under the no-action alternative would have a minor beneficial impact on wildlife. Interpretation would include general messages about the role of the prairie dog in the ecosystem, general safety, and to not feed the prairie dogs. Educating visitors can have a beneficial effect on wildlife health. These effects are minor in intensity. Interpretation and Education would have a directly beneficial, long-term effect on wildlife that might affect the site, local area, region, and beyond.

Management Strategies

Live-trapping to remove prairie dogs from developed visitor areas would have little effect on wildlife populations. The number of prairie dogs that would be trapped and relocated would be small. There would be no reduction in population numbers, only distribution. There would be some adverse disruption to wildlife, but it would be short-term and negligible. Therefore, live-trapping as a management tool would only directly affect wildlife adversely at a negligible level, locally for a short-time.

Cumulative Effects: Projects such as road or parking area improvements and exotic vegetation management have had or could have an adverse effect on wildlife because of construction noise, dust, and possible disturbance. However, under this no-action alternative, wildlife populations in the management area are not expected to be affected.

Therefore, cumulatively, wildlife populations would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: The no-action alternative would result in a lack of management of prairie dogs. This alternative would not provide standard operating procedures for a plague outbreak or reestablishment of the prairie dog colony. A plague outbreak could have a devastating impact on wildlife. Continuing these conditions could result in local, long-term, moderate, adverse impacts on wildlife.

Impacts of Alternative B

Prairie Dog Monitoring:

Monitoring would be the same as in Alternative A with additional monitoring and documentation. The effects would be slight and of little consequence to wildlife populations. The impacts of intrusion on Monument wildlife would therefore be directly adverse, site-specific, short-term, and negligible.

Plague Monitoring and Management:

This alternative would have various plague management methods that could have a beneficial impact on wildlife. Plague could be managed through monitoring, vaccinating, and burrow dusting. If plague is suspected or detected, deltamethrin pesticide could be applied to prairie dog burrows. Deltamethrin is a widely used pyrethroid pesticide which is highly toxic to insects and aquatic life, but is considered safe for wildlife and humans. Deltamethrin would have a negligible direct effect on wildlife. With application to burrows, deltamethrin would eliminate or significantly reduce the flea population, the vector of the plague bacterium in prairie dog town. If approved, a bait-delivered oral vaccine for prairie dogs could be utilized in the Monument. The vaccine could protect wildlife from the threat of a plague outbreak. If approved, it is assumed the vaccine would have negligible side effects on wildlife consuming the vaccine. By protecting prairie dogs from a potential plague outbreak and population collapse, plague management could have a moderate, long term, direct and indirect beneficial effect on wildlife on the local level.

Reestablishment:

In the event of prairie dog population collapse, there would be procedures in place for the reestablishment of the species. The reestablishment of prairie dogs in the Monument could have a beneficial effect on wildlife. Being the keystone species of the mixed-grass prairie habitat, many other wildlife species in the region depend on the prairie dog. Reestablishment of the prairie dog population would have a long-term, moderate, direct, beneficial effect on wildlife locally.

Interpretation and Education:

Improving interpretation and education in the Monument could have a positive effect on the wildlife populations. By reducing the negative impacts visitors can have on wildlife the healthier the wildlife population would be. The greatest direct impact visitors have on prairie dogs is general harassment and feeding them human food. These effects are minor in intensity. Educating visitors on the role of the prairie dog in the ecosystem, the One Health message related to prairie dogs and the negative

effects of feeding prairie dogs may have a direct beneficial long-term effect on wildlife that may affect the site, local area, region, and beyond.

Management Strategies

Passive relocation would involve closing burrows in developed visitor areas and would have little effect on wildlife populations. Passive relocation involves closing burrows with a one-way wire door to allow prairie dogs out of, but not back into their burrow. When used in developed visitor areas, this would force prairie dogs to abandon their burrowing activity in the visitor-use area and return to the prairie dog town. The number of prairie dogs that would be affected would be small. There would be no reduction in population numbers, only a change in distribution. There would be some adverse disruption to wildlife, but it would be short-term and negligible. Therefore, passive relocation as a management tool would be site-specific and have a short-term, direct, adverse effect on wildlife at a negligible level.

Physical barriers would involve temporary or permanent structures that limit prairie dog access to certain areas. These structures would have little effect on wildlife populations. The number of barriers would be few and designed to impede only small land mammals in limited areas. The general landscape and ability for wildlife to roam freely in the Monument would remain almost unchanged. There would be some adverse disruption to wildlife by redirecting path of travel, but it would be minor. Therefore, physical barriers as a management tool would have a site-specific, short-term, direct, adverse effect on wildlife at a negligible-to-minor level.

Natural barriers would consist of native vegetation such as tall grasses, rabbit brush and choke cherry to limit prairie dog access to certain areas. These natural barriers would not only limit prairie dog movement into developed areas, but would provide beneficial habitat for other wildlife. Choke cherry for example could provide cover and food for several terrestrial and avian species. Therefore, natural barriers could have a long-term, minor, beneficial effect on wildlife at the local level.

Modifications to visitor-use areas include modifications such as adding curbing to walkways to prevent tripping, or sub-surface barriers to reduce burrowing activity. These modifications would only affect a limited number of prairie dogs in high-use areas. The overall effect to the population would be minor by forcing relocation of some prairie dogs. Therefore, modifications as a management tool would have a long-term, direct, adverse effect on wildlife at a negligible-to-minor level.

Cumulative Effects: Cumulative impacts are expected to be similar to those described in Alternative A. Cumulatively, wildlife populations would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: Alternative B would help maintain the prairie dog as a keystone species at the Monument, and help protect the ecosystem they support. Some management strategies in Alternative B would have short-term negligible-to-minor adverse effects on wildlife locally, resulting from disturbance or relocation of a few individuals in high-use visitor areas. Plague management and reintroduction of the prairie dog, if the population should collapse, would have long-term, moderate, beneficial effects on wildlife. The short-term, negligible-to-minor, adverse effects on individuals are outweighed by the long-term, moderate, beneficial

effects on the ecosystem. Therefore, overall, this alternative would have moderate long-term benefits to local wildlife.

Impacts of Alternative C (Preferred Alternative)

All elements and impacts of Alternative C would be the same as Alternative B with the addition of management strategies live-trapping (negligible adverse; same as in Alternative A) and lethal control.

Lethal control to remove prairie dogs from developed visitor areas would have little effect on wildlife populations. The number of prairie dogs that would be eliminated from the designated exclusion area would have little effect on the overall colony. There would be a minor reduction in individual prairie dogs, providing for a sustainable population level, with overall wildlife populations unaffected. The use of lethal control would be extremely limited, with mitigations to reduce hazards to secondary and non-target species. There would be some adverse disruptions to wildlife, but it would be short-term and negligible. Therefore, lethal control as a management tool would directly affect wildlife populations adversely at a negligible-to-minor level, locally for a short-time.

Cumulative Effects: Cumulative impacts are expected to be similar to those described in Alternative A. Cumulatively, wildlife populations would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: Alternative C has the same conclusion as Alternative B. Overall this alternative would have moderate long-term benefits to local wildlife.

4.4 Visitor Use and Experience

Because the prairie dog town is the second most popular visitor attraction in the Monument after the Tower formation itself, it is important to maintain a prairie dog population within the Monument that achieves a sustained minimum population size and distribution that is sufficient to provide a positive visitor experience.

The prairie dog town is bordered by high-use visitor areas, bringing humans and prairie dogs in close contact. Prairie dogs inhabiting high-use areas create a safety concern for visitors and limits access to those areas.

The thresholds for this impact assessment are as follows:

Intensity Level Definitions

Negligible: Visitors would not be affected or changes in visitor use and experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor use and experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor use and experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major: Changes in visitor use and experience would be readily apparent and have substantial long-term consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Impacts of Alternative A (No-Action Alternative)

Prairie Dog Monitoring:

Intrusion by individuals performing prairie dog monitoring by walking through prairie dog town may cause short-term, negligible disturbance to visitor experience. There may be some escape-flight response from wildlife during these activities, but this would produce negligible short-term adverse impacts in the form of reduced wildlife sightings. The overall level of disturbance would be negligible and of little consequence to wildlife viewing. The impacts of intrusion on wildlife viewing would therefore be directly adverse, site-specific, short-term, and negligible.

Plague Monitoring and Management:

The lack of plague management could have a moderate negative effect on visitor use and experience. If there were a plague outbreak, a catastrophic collapse of the prairie dog population could occur, directly and adversely affecting visitor experience. The lack of standard operating procedures for plague management could create a moderate risk to human health and safety if there were a disease outbreak. Plague management could reduce or eliminate these threats. Therefore, the lack of plague management could directly and indirectly have a moderate, adverse, long-term effect on visitor use and experience.

Reestablishment:

In the event of prairie dog population collapse, there would be no procedures in place for the reestablishment of the species under this alternative. Not reestablishing prairie dogs in the Monument could have an adverse effect on visitor use and experience. Being the second most popular visitor attraction in the Monument, wildlife viewing is a popular part of visitor use. Therefore, not reestablishing the prairie dog population would have a long-term, moderate, direct, adverse effect on visitor use and experience.

Interpretation and Education

Present interpretation and education under the no-action alternative would have minor beneficial effects on visitor experience. Interpretation would include general messages about the role of the prairie dog in the ecosystem, general safety and to not feed the prairie dogs. Interpretation and Education would have a directly beneficial, long-term minor effect on wildlife that may affect the site, local area, region and beyond.

Management Strategies

Live-trapping to remove prairie dogs from developed visitor areas could have a minor effect on visitor experience. The number of prairie dogs that would be trapped and relocated would be small, but this would take place in highly visible locations. Live-trapping may require three traps per burrow that would be visible during peak visitation hours in locations such as the campground and picnic area. Some visitors may object to the trapping and relocation of prairie dogs, adversely affecting visitor experience, but only in the short-term. Live-trapping would also have long-term minor beneficial effects on visitor use and experience by improving human health and safety. Prairie dogs in developed visitor areas present health and safety issues. Live-trapping could help eliminate those issues. This strategy could take several weeks or months to provide the desired results. Therefore, live-trapping as a management tool could have short-term or long-term minor effects on visitor use and experience in an adverse or beneficial way. These effects would be site specific.

Cumulative Effects: Projects such as campground improvements, road or parking area improvements, and exotic vegetation management have had or could have an adverse effect on visitor use and experience because of construction noise, dust, disturbance, and possible area closures. However, under this no-action alternative, visitor use and experience in the management area are not expected to be affected. Therefore, cumulatively, visitor use and experience would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: The no-action alternative would not provide the most positive visitor experience. This alternative has one management techniques with both beneficial and adverse effects to visitor use and experience. Most notably, the no-action alternative would not provide standard operating procedures for a plague outbreak and management. A plague outbreak could have a moderate impact on visitor experience due to human health and safety concerns, and by causing a decline in wildlife viewing. Continuing these conditions could result in local long-term, moderate, adverse impacts on visitor use and experience.

Impacts of Alternative B

Prairie Dog Monitoring:

Impacts would be the same as in Alternative A, intrusion on wildlife viewing would have a directly adverse, site-specific, short-term, minor effect.

Plague Monitoring and Management:

Various plague management methods could have a beneficial impact on visitor use and experience. Flea monitoring would have a similar effect as prairie dog monitoring, producing a minor adverse effect to visitor experience, but these effects would be short-term. Plague could be managed through monitoring, vaccinating, and burrow dusting. If plague is suspected or detected, areas would be closed to visitors and deltamethrin pesticide could be applied to prairie dog burrows. Deltamethrin is a widely used pyrethroid pesticide which is highly toxic to insects and aquatic life, but is considered safe around wildlife and humans. Area closure and burrow dusting would have a moderate direct adverse effect on visitor use and experience by restricting visitor access. Plague management would also have a

moderate, beneficial effect on human health and safety. With direct application to burrows, deltamethrin would eliminate or significantly reduce the flea population, the vector of the plague bacterium in prairie dog town. If approved, a bait-delivered oral vaccine for prairie dogs could be utilized in the Monument. The vaccine could protect wildlife from the threat of a plague outbreak. By protecting prairie dogs from a potential plague outbreak and population collapse, visitor experience and human health and safety would benefit. Therefore, overall, plague management could have a moderate, long term, direct and indirect beneficial impact on visitor use and experience at the local level.

Reestablishment:

In the event of prairie dog population collapse, there would be procedures in place for the reestablishment of the species under this alternative. The reestablishment of prairie dogs in the Monument could have a beneficial effect on visitor use and experience. Being the second most popular visitor attraction in the Monument, wildlife viewing is a popular part of visitor use. Therefore, reestablishing the prairie dog population would have a long-term, moderate, direct, beneficial effect on visitor use and experience.

Interpretation and Education:

Improving interpretation and education in the Monument would have a positive effect on visitor use and experience. Educating visitors on the role of the prairie dog in the ecosystem and the One Health message related to prairie dogs could improve human health and safety. Therefore, interpretation and education may have a direct, beneficial, long-term effect on visitor use and experience in the Monument.

Management Strategies

Passive relocation would involve closing burrows in developed visitor areas and have a minor short term effect on visitor experience. Passive relocation involves closing burrow with a one way wire door to allow prairie dogs out, but not back into their burrow. When used in developed visitor areas, this would force prairie dogs to abandon their burrowing activity in the visitor area and return to the prairie dog town. There would be some adverse disruption wildlife viewing, but it would be short-term and negligible. Passive management may create a minor, short-term, adverse visual effect in the visitor-use area. Although there would be short-term adverse effects to visitor experience associated with passive relocation, it would add to visitor safety by removing hazards associated with prairie dog interactions. Improving visitor safety would have long-term benefits to visitor use and experience. This strategy could take weeks or months to provide the desired results. Therefore, passive relocation as a management tool would have site-specific, short-term, direct, beneficial effects on visitor use and experience at a minor level.

Physical barriers would involve temporary or permanent structures that limit prairie dog access to certain areas. When used in developed areas, barriers would prevent prairie dogs from moving into designated visitor areas. The number of barriers would be few and designed to impede only small land mammals in limited areas. The general viewshed and ability for visitors to view wildlife would remain almost unchanged. There would be some adverse effects to visitor experience with visual disturbance of the natural landscape, but these would be minor. Although physical

barriers could have minor adverse effects on visitor experience, physical barriers would add to visitor safety by reducing hazards associated with prairie dog interactions. Improving visitor safety would have long-term benefits to visitor use and experience. Therefore, physical barriers as a management tool would have site-specific, long-term, direct, beneficial effects on visitor use and experience at a moderate level.

Natural barriers would consist of native vegetation such as tall grasses, rabbit brush, and choke cherry to limit prairie dog access to certain areas. These natural barriers would not only limit prairie dog movement into developed areas, but would provide beneficial habitat for other wildlife. Choke cherry for example could provide cover and food for several terrestrial and avian species. An increase in vegetation may provide more wildlife viewing opportunities for visitors. This strategy could take months or years to provide the desired results. Therefore, natural barriers could have a long-term, moderate, beneficial effect on visitor use and experience at the local level.

Modifications to visitor-use areas include modifications such as adding curbing to walkways to prevent tripping, or sub-surface barriers to reduce burrowing activity. These modifications would only affect a limited number of high-use areas. Improving visitor safety would have long-term benefits to visitor use and experience. Therefore, visitor-use area modifications as a management tool would have site-specific, long-term, direct, beneficial effects on visitor use and experience at a moderate level.

Cumulative Effects: Projects such as campground improvements, road or parking area improvements, and exotic vegetation management have had or could have an adverse effect on visitor use and experience because of the inconvenience of construction noise, dust, and possible restrictions of access. The addition of management strategies under this alternative, such as barriers and modifications to trails, could have a minor to moderate effect on visitor use and experience. However, through the use of mitigation measures, effects to visitor use and experience in the management area are expected to be minor. Ultimately, these actions have had or would have had a beneficial effect on visitor use and experience because of the long-term improvements to the human health and safety aspects of the Monument, interpretive opportunities, and functionality of the Monument. Therefore, cumulatively, visitor use and experience would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: Implementation of this alternative would allow for the management of prairie dogs at the Tower while allowing visitors continued access to visitor-use areas such as the campground, amphitheater, picnic area, and interpretive areas. Although some management strategies would have adverse effects on visitor use and experience, Alternative B would improve the safety of visitors by excluding prairie dogs from visitor-use areas. Without the option of lethal control, management of prairie dogs creating an immediate threat to human health and safety may be slow in response. In addition, plague management would improve wildlife viewing opportunities and public health and safety. If the prairie dog population should crash, procedures would be in place to reintroduce them, improving visitor experience. This alternative would have a minor-to-moderate, long-term,

beneficial effect on visitor use and experience by improving safety, and allowing continued access to visitor-use areas and wildlife viewing.

Impacts of Alternative C (Preferred Alternative)

All elements and impacts of Alternative C would be the same as Alternative B with the addition of the management strategies live-trapping (adverse or beneficial effects; same as in Alternative A) and lethal control.

Lethal control to remove prairie dogs from developed visitor areas could have a minor-to-moderate effect on visitor experience. The number of prairie dogs that would be eliminated by lethal control would most likely be small, but this would take place in highly used visitor locations. Areas being treated with zinc phosphide would be temporarily closed to visitors to insure their health and safety. Closures would be rare and lasting a few days to a week having only minor effects on overall visitor use. Some visitors may strongly object to lethal control of prairie dogs, adversely affecting visitor experience. To mitigate these effects, control would take place when visitors are not present, most likely in the early morning, late evening, or overnight. Lethal control would also have long-term minor-to-moderate beneficial effects on visitor use and experience by improving human health and safety. Prairie dogs in developed visitor areas present health and safety issues. Lethal control could help eliminate those issues. This is the quickest method to remove immediate threats. Therefore, lethal control as a management tool could have short-term or long-term minor-to-moderate effects on visitor use and experience in an adverse or beneficial way. These effects would be site specific.

Cumulative Effects: Cumulative impacts are expected to be the same as Alternative B, in which visitor use and experience would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: The conclusion would be the same as Alternative B with the addition of live-trapping and lethal control creating some adverse effects to visitor use and experience. The overall beneficial improvements to public health and safety still outweigh adverse effects of these management strategies. If there is an immediate threat to human health and safety, the Preferred Alternative would allow for a more timely response. Under the Preferred Alternative, the management of prairie dogs would allow for a sustainable population of prairie dogs for visitor viewing, maintain access to high-use visitor areas and improve safety for visitors. This alternative would have moderate, long-term, beneficial impacts on visitor use and experience.

4.5 Monument Operations

Because the prairie dog town is bordered by developed high-use visitor areas, the prairie dog colony can have a direct impact on Monument operations. Prairie dogs inhabiting high-use areas can create human health and safety concerns and limit access to those areas. Prairie dogs moving into visitor-use areas endanger Monument infrastructure and increase maintenance workload.

The thresholds for this impact assessment are as follows:

Intensity Level Definitions

Negligible: Monument operations would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on Monument operations.

Minor: The effect would be detectable and likely short-term, but would be of a magnitude that would not have an appreciable effect on Monument operations. If mitigation was needed to offset adverse effects, it would be simple and likely successful.

Moderate: The effects would be readily apparent, likely long-term, and would result in a substantial change in Monument operations in a manner noticeable to staff and to the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.

Major: The effects would be readily apparent and would result in a substantial change in Monument operation in a manner noticeable to staff and the public and be markedly different from existing operations. Extensive mitigation measure to offset adverse effects would be needed and their success could not be guaranteed.

Impacts of Alternative A (No-Action Alternative)

Prairie Dog Monitoring:

Other than the time investment, individuals performing prairie dog monitoring by walking through prairie dog town would have no measurable impact on Monument operations. Data would be provided to show population trends and allow for better resource management. The data provided would have a long-term minor impact on Monument operations.

Plague Monitoring and Management:

The lack of plague management could have a major negative effect on Monument operations. If there were a plague outbreak, the lack of standard operating procedures for plague management could severely disrupt normal Monument operations. The public could be placed at risk creating an emergency situation. Visitor-use areas may be unnecessarily closed. Plague management procedures could reduce or eliminate these threats. Therefore, the lack of plague management could directly and indirectly have a moderate, adverse, long-term effect on Monument operations.

Reestablishment:

In the event of prairie dog population collapse, there would be no procedures in place for the reestablishment of the species under this alternative. Not reestablishing prairie dogs in the Monument would prevent the Monument from accomplishing one of its directives. NPS Management Policies Section 4.4 states the National Park Service will maintain as parts of the natural ecosystems of parks, all animals native to park ecosystems. The Service will successfully maintain native

animals by preserving and restoring the natural abundances of native animal populations and the communities and ecosystems in which they occur. Therefore, not reestablishing the prairie dog population would have a long-term, moderate, direct, adverse effect on Monument operations.

Interpretation and Education

Present interpretation and education under the no-action alternative would have a minor beneficial effect on Monument operations. Interpretation would include general messages about the role of the prairie dog in the ecosystem, general safety and to not feed the prairie dogs. These messages would aid in the day to day operations of the Monument. The lack of interpretive information on plague management or the One Health message would have a negligible effect on Monument operations. Overall, interpretation and education would have a directly beneficial, site specific, minor effect on Monument operations.

Management Strategies

Live-trapping to remove prairie dogs from developed visitor areas could have a moderate, beneficial effect on Monument operations. Prairie dog activity in developed areas could threaten infrastructure, increase maintenance workload and cause area closures. Live-trapping could help eliminate those issues. Live-trapping may require three traps per burrow, require intensive labor hours to set and check traps, and may take several weeks to be effective. Therefore, live-trapping as a management tool could have long-term, moderate, beneficial effects on Monument operations. These effects would be site specific.

Cumulative Effects: Projects such as road or parking area improvements and exotic vegetation management have had or could have an adverse effect on Monument operations because of the inconvenience of construction noise, dust, and possible restrictions of access. Ultimately however, these actions had or would have had a beneficial effect on Monument operations. Under this no-action alternative, Monument operations in the management area are not expected to change, and past actions have had beneficial impacts on Monument operations. Therefore, cumulatively, Monument operations would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: The no-action alternative would adversely affect Monument operations if present conditions continue. Although this alternative provides one strategy with beneficial effects for Monument operations, there are no strategies to prevent prairie dogs from encroaching on visitor-use areas. The lack of preventative measures would result in continuing maintenance issues, threats to infrastructure, increased workloads and possibly limiting visitor access to camping, picnicking and interpretive programs. The lack of procedures for plague management could create issues for Monument operations if an outbreak occurred. The lack of reestablishment would prevent the Monument from accomplishing its directives. Continuing these conditions would result in long-term, moderate, adverse impacts on Monument operations.

Impacts of Alternative B

Prairie Dog Monitoring:

Monitoring would have the same impact as in Alternative A, data collected from monitoring would have a long-term, minor, beneficial impacts on Monument operations.

Plague Monitoring and Management:

Various plague management methods could have a beneficial impact on Monument operations. A potential plague outbreak could disrupt normal Monument operations and cause closure of visitor-use areas. Standard operating procedures for plague management could eliminate these threats. If approved, bait-delivered vaccine could reduce or eliminate the threat of a plague outbreak. The vaccine would also reduce or eliminate the threat of population collapse, and the need to reintroduce prairie dogs. Monitoring and management procedures would help prevent unnecessary closure of visitor-use areas. Standard operating procedures and decision-making tools would provide for more organized and efficient management of an outbreak. With direct application to burrows, deltamethrin would eliminate or significantly reduce the flea population, the vector of the plague bacterium in prairie dog town. Therefore, plague management would have moderate, long term, site-specific, direct and indirect, beneficial impact on Monument operations.

Reestablishment:

In the event of prairie dog population collapse, there would be procedures in place for the reestablishment of the species under this alternative. NPS Management Policies Section 4.4 states the National Park Service will maintain as parts of the natural ecosystems of parks all animals native to park ecosystems. The Service will successfully maintain native animals by preserving and restoring the natural abundances of native animal populations and the communities and ecosystems in which they occur. The reestablishment of prairie dogs in the Monument would have a beneficial effect on Monument operations by allowing the Monument to reach its directives. Therefore, reestablishing the prairie dog population would have a long-term, moderate, direct, beneficial effect on Monument operations.

Interpretation and Education:

Improving interpretation and education in the Monument would have a positive effect on Monument operations. Educating visitors on the role of the prairie dog in the ecosystem, the One Health message related to prairie dogs and the negative effects of feeding prairie dogs would help the Monument reach its interpretive mission. Improving interpretation would have a minor, direct, beneficial, long-term effect on Monument operations.

Management Strategies

Passive relocation would involve closing burrows in developed visitor areas would have a moderate beneficial effect on Monument operations. Passive relocation involves the use of a one way wire door to allow prairie dogs out, but not back into their burrow. When used in developed visitor areas, this would force prairie dogs to abandon their burrowing activity in the visitor area and return to the prairie dog town. Passive relocation of prairie dogs would reduce maintenance in visitor-use areas,

protect infrastructure, and allow visitors access to critical areas such as the campground, picnic area and amphitheater. This strategy could take several weeks to gain results. Therefore, passive relocation as a management tool would have site-specific, short-term, direct, beneficial effects on Monument operations at a minor level.

Physical barriers would involve temporary or permanent structures that limit prairie dog access to certain areas. When used in developed areas, barriers would prevent prairie dogs from moving into designated visitor areas. The number of barriers would be few and designed to impede only small land mammals in limited areas. Physical barriers would have preventative effects and reduce re-inhabitation of visitor areas cleared of prairie dogs. Physical barriers would reduce maintenance in visitor-use areas, protect infrastructure and allow visitor access to critical areas such as the campground, picnic area and amphitheater. Therefore, physical barriers as a management tool would have site-specific, long-term, direct, beneficial effects on Monument operations at a moderate level.

Natural barriers would consist of native vegetation such as tall grasses, rabbit brush and choke cherry to limit prairie dog access to certain areas. Vegetative barriers would have preventative effects and reduce re-inhabitation of visitor areas cleared of prairie dogs. Vegetative barriers would reduce maintenance in visitor-use areas, protect infrastructure and allow visitor access to critical areas such as the campground, picnic area and amphitheater. This strategy could take months or years for desired results. Therefore, natural barriers as a management tool would have site-specific, long-term, direct, beneficial effects on Monument operations at a moderate level.

Modifications to visitor-use areas include modifications such as adding curbing to walkways to prevent tripping, or sub-surface barriers to reduce burrowing activity. These modifications would only affect a limited number of high-use areas. Trails, walkways, signs, and other features could be modified to reduce the impact of prairie dog activity. Modifications would be a more permanent, long-term protection of infrastructure and reduce maintenance time. Therefore, modifications as a management tool would have moderate, site-specific, long-term, direct, beneficial effects on Monument operations.

Cumulative Effects: Projects such as campground improvements, road or parking area improvements, and exotic vegetation management have had or could have an adverse effect on Monument operations because of the inconvenience of construction noise, dust, and possible area closures. The addition of management strategies under this alternative, such as barriers and modifications to trails, could have a minor to moderate effect on Monument operations. However, through the use of mitigation measures, effects to Monument operations in the management area are expected to be minor. Ultimately, these actions would have a beneficial effect on Monument operations because of the long-term improvements to infrastructure; interpretive opportunities; and functionality of the Monument. Therefore, cumulatively, Monument operations would not appreciably change when considered with other past, present and reasonably foreseeable future actions.

Conclusion: Implementing this alternative would allow for the management of prairie dogs at the Monument while providing visitors continued access to areas such as the campground, amphitheater, and picnic areas. Although some management strategies would take some time to establish, Alternative B would include long-term preventative measures. Alternative B would reduce reoccurring maintenance issues with modification of features. Barriers would protect infrastructure and visitor-use areas from re-occupation after being cleared of prairie dogs. In addition, standard operating procedures and a decision-making tool for plague management would improve the effectiveness of Monument operations. If the prairie dog population should crash, procedures would be in place to reintroduce them, allowing the Monument to meet its directives. Over all, this alternative would have moderate, long-term, beneficial effects on Monument operations.

Impacts of Alternative C (Preferred Alternative)

All elements and impacts are the same as Alternative B with the addition of the management strategies live-trapping (moderate beneficial effects; same as in Alternative A) and lethal control.

Lethal control to remove prairie dogs from developed visitor areas could have a moderate beneficial effect on Monument operations. Prairie dog activity in developed areas could threaten infrastructure, increase maintenance workload, and cause area closures. Lethal control could help eliminate those issues. If burrowing activity immediately threatens infrastructure or human health and safety, lethal control provides the quickest management response. The use of carbon monoxide cartridges requires little training and can be performed in minutes. Zinc phosphide is a restricted use pesticide and requires a pesticide applicator's license. Zinc phosphide may take several days to a week to prepare the site, apply and clean up. Both methods provide a quick response for immediate threats. Therefore, lethal control as a management tool would have long-term moderate beneficial effects on Monument operations. These effects would be site specific.

Cumulative Effects: Cumulative effects of Alternative C are expected to be the same as in Alternative B.

Conclusion: Implementation of the preferred alternative would allow for the management of a healthy prairie dog population at the Tower while allowing visitors continued access to camping, picnicking, and interpretive programs. Although some management strategies would take time to establish, Alternative C would have long term preventative measures. This alternative would reduce reoccurring maintenance issues with modification of features. Barriers would protect infrastructure and visitor-use areas from re-occupation after being cleared of prairie dogs. The addition of live-trapping and lethal control would allow a full range of management options. Strategies that allow for a quick response would be available for immediate threats to infrastructure. In addition, standard operating procedure and decision-making for plague management would improve the effectiveness of Monument operations. If the prairie dog population should crash, procedures would be in place to reintroduce them, allowing the Monument to meet its directives. Over all, the preferred alternative would have moderate, long-term, beneficial effects on Monument operations.

CHAPER 5: CONSULTATION AND COORDINATION

5.1 Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from Devils Tower National Monument, the NPS Intermountain Region, and Midwest Region. The interdisciplinary team included biologists, wildlife biologists, program managers, public health officers, and a landscape architect. The purpose and need for the project, various alternatives, potential environmental impacts, and possible mitigation measures were discussed.

5.2 External Scoping

On November 3, 2011 scoping brochures were sent out to 129 individuals and organizations. Brochures were mailed to local businesses and land owners, area post offices, senators, representatives, county commissioners, land management agencies, 24 tribal councils, 11 newspapers, 18 radio stations, the governor's office, and others. A one-page press release was sent via email to 100 contacts including individuals, local businesses and land owners, senators, representatives, newspapers, radio stations, tribal members, and others expressing interest in Devils Tower news. Information was provided on how to submit comments by mail, in person, and on the Planning, Environment and Public Comment (PEPC) site. In addition, an announcement was placed on the front page of the Monument website www.nps.gov/deto.

A total of 13 responses were received, 3 were "no comment" (omitted from summary and analysis). Of these responses, 4 were received via postal mail and 9 were received electronically through PEPC. Comments were reviewed and organized according to management strategies or area of concern. For more information see section 1.6 of this document.

5.3 Agency Consultation

The following agencies were contacted during public scoping process.

Federal:

Bureau of Land Management

New Castle Office

Wyoming State Office

National Forest Service

Black Hills National Forest

Bighorn National Forest

Bridger-Teton National Forest

Shoshone National Forest

National Park Service

Badlands National Park

Bighorn Canyon Recreation Area

Fossil Butte National Monument

Grand Teton National Park

Jewel Cave National Park

Mount Rushmore National Memorial

Wind Cave National Park

Yellowstone National Park
US Fish and Wildlife Service
US Representative Cynthia Lummis

In accordance with the ESA, Section 7 consultation with the US Fish and Wildlife Service (USFWS) concerning impacts to threatened and endangered species was initiated during the initial drafting of this Plan/EA. A letter initiating informal consultation and requesting a list of federal threatened and endangered species was sent to Wyoming Service Office on June 25, 2012. The Wyoming USFWS submitted a list of threatened, endangered and candidate species for Crook County. Information on special status species is found in section 1.8 of this document.

State:

Department of Environmental Quality
Governor Matt Mead
Representative Mark A. Semlek
Senator John Barrasso
Senator Mike Enzi
WYDOT Headquarters

Wyoming Game and Fish Department – “no comment” was received by letter on Nov. 9, 2011 following public scoping. The Wyoming Game and Fish Department was contacted by letter on September 19, 2012 requesting consultation on state-listed species or designated critical or essential habitat in the proposed project area. After 60 days, no response was received.

Wyoming Office of Tourism

Wyoming State Park & Historic Sites

Wyoming State Historical Preservation Office - During public scoping the Wyoming State Historic Preservation Office responded by letter on November 21, 2011 with “While we do not have any formal comments at this time, we would like to participate in the process. Additional consultation on specific undertakings may be necessary for SHPO concurrence and to comply with Section 106 of the National Historic Preservation Act.” If any prairie dog management activity would potentially affect a historic structure, a project-specific plan would be drafted. At that time, Section 106 consultation would be initiated. The Monument would seek a letter of concurrence from the SHPO for a determination of ‘no historic structures affected.’

County:

Campbell County Chamber of Commerce

Crook County Commissioners - commented by letter on November 30, 2011.

Crook County Sheriff

Crook County Weed and Pest

5.4 Native American Consultation

Twenty-four Native American tribal representatives were contacted through the public scoping process including:

- Apache Tribe Of Oklahoma
- Blackfeet Tribal Business Council
- Cheyenne and Arapaho Tribes of Oklahoma

- Cheyenne River Lakota Tribal Council
- Confederated Salish & Kootenai Tribal Council
- Crow Creek Sioux Tribal Council
- Crow Tribal Council
- Flandreau Santee Lakota Executive Committee
- Fort Belknap Community Council
- Fort Peck Tribal Executive Board
- Kiowa Indian Tribe of Oklahoma
- Lower Brule Lakota Tribal Council
- Arapaho Business Council
- Northern Cheyenne Tribal Council
- Oglala Lakota Tribal Council
- Rosebud Sioux Tribal Council
- Santee Sioux Nation
- Shoshone Business Council
- Sisseton-Wahpeton Lakota
- Spirit Lake Lakota Tribal Council
- Standing Rock Lakota Tribal Council
- Three Affiliated Tribes Business Council
- Turtle Mountain Chippewa Tribal Council
- Yankton Lakota Tribe Business and Claims

No responses were received from Native American tribes though public scoping.

On June 12-13, 2012 tribal consultation meetings were held at Devils Tower National Monument. All tribal representatives listed above, with the addition of Sisseton-Wahpeton Oyate Tribal Historic Preservation Officer (THPO), were invited to participate in the consultation meeting. Representatives from the following tribes were present:

- Cheyenne River Lakota
- Crow Creek Sioux THPO
- Crow Nation
- Crow Tribe THPO
- Lower Brule Sioux
- Rosebud Sioux
- Sisseton-Wahpeton Oyate
- Sisseton-Wahpeton Oyate THPO

No formal comments were made. There were no objections to the proposed Plan/EA.

5.5 Environmental Assessment Review and List of Recipients

The Environmental Assessment will be released for public review on August 1, 2013. To inform the public of the availability of the Environmental Assessment, NPS will publish and distribute a letter or press release to various newspapers, radio stations, agencies, tribes, and members of the public on the National Monument's mailing list. Copies of the Environmental Assessment will be available for review on the internet at <http://parkplanning.nps.gov/>. Copies of the document will also be provided to interested individuals upon request.

The Environmental Assessment is subject to a 30-day public comment period ending August 30, 2013. During this time the public is encouraged to post comments online at <http://parkplanning.nps.gov/> or mail comments to Superintendent; Devils Tower National Monument; PO Box 10, Devils Tower, WY 82714. Following the close of the comment period, all public comments will be reviewed and analyzed prior to the release of a decision document. NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the Environmental Assessment as needed.

5.6 List of Preparers

Preparers (developed EA content):

- Christopher N. Klinger, Biological Science Technician, National Park Service, Devils Tower National Monument, Wyoming.
- Rene E. Ohms, Chief of Resource Management, National Park Service, Devils Tower National Monument, Wyoming.
- Angela J. Wetz, [former] Chief of Resource Management, National Park Service, Devils Tower National Monument, Wyoming.

With assistance from:

- Michael Wheeler, Intern, American Conservation Experience, Devils Tower National Monument, Wyoming.
- Megan Chapman, Intern, American Conservation Experience, Devils Tower National Monument, Wyoming.

Consultants (provided information):

- Daniel Bryan Tinker, Department of Botany, University of Wyoming, Laramie, Wyoming
- Lori J Kayes, Department of Botany, University of Wyoming, Laramie, Wyoming
- Dan Licht, Midwest Region Wildlife Biologist, National Park Service, Omaha, Nebraska
- Myron Chase, Natural Resource Specialist-IPM, National Park Service - Intermountain Regional Office
- LCDR George A. Larsen, USPHS, M.S., REHS, Public Health Consultant, National Park Service, Public Health Program, Intermountain Region, Yellowstone National Park
- Debra Frye, Landscape Architect, National Park Service, Intermountain Region - Denver Office

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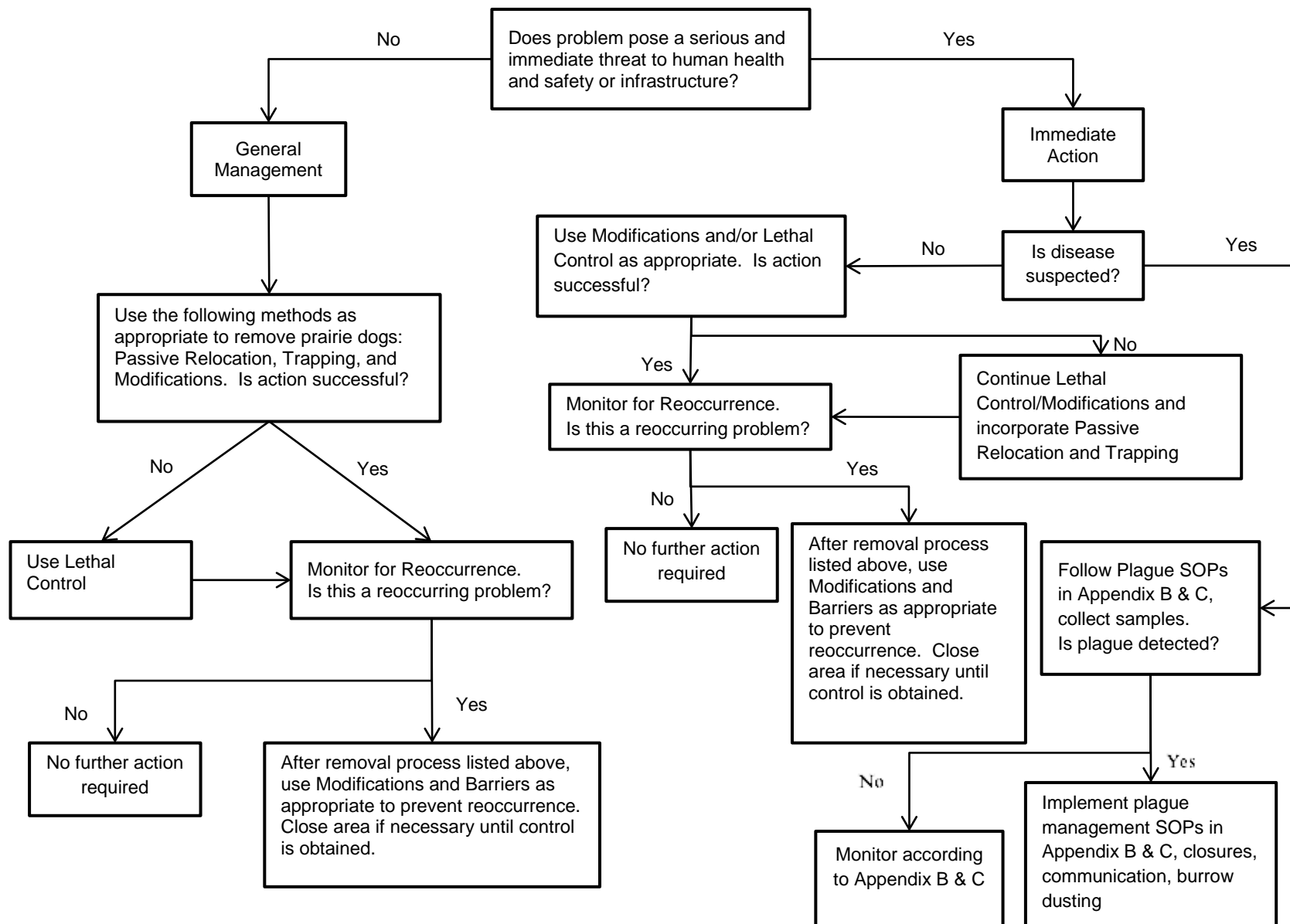
APPENDICES

Appendix A: Management and Decision-making Tool

Triggers

Trigger	Example	Action
Prairie dog inside allowable area	Prairie dog feeding in prairie dog town	No Action
Prairie dog burrowing outside allowable area	Prairie dog found burrowing beside trailer drop off area	Control needed; use decision-making tool
Dead prairie dogs, disease suspected	A dead zone is found in prairie dog town	Control needed; use decision-making tool, go to "Immediate Action"
Dead prairie dog, single individual, no disease suspected	Prairie dog found dead beside road	No Action
Prairie dog spotted in high-use visitor area	Prairie dogs feeding in picnic area.	Control needed; use decision-making tool
Prairie dog burrowing in high-use visitor area	Prairie dog burrowing in campground	Control needed; use decision-making tool
Prairie dog burrowing near foot path	Prairie dog burrowing near amphitheater walkway	Control needed; use decision-making tool
Prairie dog burrowing near infrastructure	Prairie dog burrowing near interpretive sign	Control needed; use decision-making tool
Prairie dog burrowing near sensitive infrastructure	Prairie dog burrowing near an electrical fixture	Control needed; use decision-making tool, go to "Immediate Action"

Prairie Dog Management Decision-making Tool



Appendix B: Plague and Flea Monitoring

Plague and Flea Monitoring

(Information in this appendix is from: Western Association of Fish and Wildlife Agencies. 2006. Draft Gunnison's prairie dog conservation plan: Addendum to the white-tailed and Gunnison's prairie dog conservation strategy. Western Association of Fish and Wildlife Agencies. Laramie, Wyoming. Unpublished Report. 41 pp.)

Prairie Dog Sylvatic Plague Monitoring Protocol

Since its documented appearance in wild rodents on the Pacific Coast of North America in the early 1900s, sylvatic plague has spread eastward to approximately the 103rd Meridian, affecting sciurid and cricetid rodents, insectivores, lagomorphs, carnivores, and humans (bubonic plague) (Barnes 1982; Cully 1993). Prairie dog species are extremely susceptible to this typically flea-borne disease and may serve as "amplifying hosts" (Barnes 1993).

Plague epizootics may originate from focal areas, with possible maintenance in non-focal areas between epizootics. During epizootics, plague can spread over great distances and in the process affect humans, most often during and shortly following epizootics (Cully 1993). Several wildlife species are considered enzootic or maintenance species for sylvatic plague, meaning individuals have some or considerable resistance to the disease. Examples include the California vole (*Microtus californicus*) in San Mateo County, California, kangaroo rats (*Dipodomys* spp.), deer mice (*Peromyscus maniculatus*), and northern grasshopper mice (*Onychomys leucogaster*) (Cully 1993).

In the past, plague has been monitored for the protection of human health and conservation of prairie dog populations for ecosystem values, particularly protection of reintroduced populations of black-footed ferrets

Application of deltamethrin insecticide (e.g., Deltadust), as a prophylactic treatment for flea control in burrows, is sometimes used prior to prairie dog relocation into plague-affected colonies. This technique may have limited applicability for flea control in other situations and is the only active treatment method currently available.

Sylvatic plague surveillance methods are summarized below.

Technique	Description
"Windshield surveys"	General observations of prairie dog towns to detect die-offs, with follow-up evaluations needed to confirm cause and status.
Collection and analysis of dead prairie dogs	Prairie dogs often die in burrows, but a small percentage of those exposed to plague die above-ground and can be picked up if colonies are regularly surveyed for dead and dying prairie dogs
Collection and analysis of fleas from prairie dog burrows	This technique has had widespread use as a surveillance technique for human health concerns.
Collection of blood samples from members of Order Carnivora, especially	Although such species as badgers and coyotes can become infected with plague, their primary role in the disease cycle is the transport of plague-infected fleas (Poland and Barnes 1979)

Technique	Description
coyotes and badgers	<p>cited in Gage et al. 1994). Nobuto blood-sampling papers have been used extensively, since the technique does not require access to refrigerators and requires only 0.2 ml of blood (Wolff and Hudson 1974, Gage et al. 1994).</p> <p>This technique has recently been used in association with black-footed ferret reintroduction, either via collection of blood samples from live animals, dead animals collected for this purpose, or animals killed during animal damage control activities (Anderson et al. Undated, Williams et al. 1998, Matchett 2001). In addition, black-footed ferrets captured for removal of radio collars, for implantation of transponder chips, or for canine distemper vaccination can be bled for disease analysis samples.</p>
Collection of blood samples from domestic dogs	Barnes (1982) reported using domestic dogs as sentinels for exhibiting antibodies to plague. This technique has been effective on Native American reservations in the Southwest to detect seroconversion before plague was observed in rodents or humans.
Collection of blood from potentially resistant small mammals	<p>Certain rodent species appear to be resistant to plague and may serve as maintenance or enzootic hosts that maintain plague between epizootics (Cully 1993, Gage et al. 1994).</p> <p>The Wyoming Game and Fish Department has monitored small mammals for plague seroconversion in Shirley Basin, Wyoming (Luce et al. 1994, 1996, 1997). Trapping efforts focused on deer mice and grasshopper mice, with the assumption that active plague would be detectable by antibodies produced during the short life span of these rodents. These investigations detected a relationship between seroprevalence of plague in deer and grasshopper mice and status of white-tailed prairie dog populations in Shirley Basin.</p>

ACTIONS:

1. Staff initiates a public information program to inform adjacent landowners, visitors, and other members of the public concerning the need to notify the agency of die-offs of prairie dogs or ground squirrels.
2. Staff informs state wildlife management agency personnel, adjacent land management agencies, local veterinarians, and other government personnel that deal with animal control, or have regular contact with landowners and the public, of the need for reporting die-offs.
3. Staff may provide, as needed, information for state wildlife management agency personnel, adjacent land management agencies, local veterinarians, and other government

personnel that deal with animal control, on protocols for collection of dead prairie dogs and ground squirrels, packaging and record keeping.

The Centers for Disease Control (CDC), Fort Collins, Colorado has extensive experience conducting disease surveillance in wild mammals. CDC does not charge for diagnostic services, but has limited laboratory capacity. In addition to testing for plague, specimens may also be tested for tularemia, pasteurellosis, undetected poisoning, drowning, and predator kill.

4. Staff would develop windshield survey routes throughout the prairie dog habitat to be conducted on a routine basis (e.g. biweekly, monthly, annually) by staff where prairie dogs occur, particularly during March and April. Windshield surveys would follow the CDC protocol (attached). Significant decline in any colony or complex should be immediately reported to the Monument resource manager.

In the event of a suspected die-off (if a windshield survey route reports a significant loss of prairie dogs or ground squirrels), the staff would implement the plague contingency plan immediately (attached).

Make inquiries to determine whether or not the colony was poisoned, or whether mortalities were due to shooting.

If neither shooting nor poisoning occurred, the colony or complex should be searched for prairie dog and ground squirrel carcasses as soon as possible after discovery of the population decline. Carcasses should be handled in the field according to protocol (attached).

C. In the event that carcasses cannot be found, and the disappearance of prairie dogs is verified as recent, burrow swabbing should be conducted to collect fleas according to CDC protocol (attached).

6. If plague is verified, the resource manager, in cooperation with NPS public health officials and CDC, should immediately notify, and make plague contingency recommendations to, the following: landowners and wildlife agency personnel in the affected area, state Department of Agriculture, USDA-Wildlife Services, NRCS, veterinarians, and local government personnel that deal with animal control, and the general public through local media sources. The NPS public health officials and CDC should be consulted on the need for insecticide treatment at this time to control fleas in burrows, and therein reduce the potential for further plague infections.

7. Post-plague monitoring of prairie dog colonies should be conducted annually in March or April (or more frequently, if possible) to document the rate of re-colonization and verify occupied acreage. Initial monitoring, which would take place from one to several years, should consist of windshield surveys. When visual surveys indicate prairie dog colonies are recovering, a quantitative survey method should be initiated. The recommended method, due to widespread use, particularly on black-footed ferret reintroduction sites, is transecting using the Biggins method (Biggins et al., 1993) that equates active and inactive burrow densities to population density.

8. The resource manager and staff should evaluate the extent of the impact of the epizootic as it affects the acreage and distribution objectives in the management plan. The group should determine whether or not there is a need to modify prairie dog management in the plague area, and potentially elsewhere in the Monument, if occupied acreage is below the objectives in the management plan.

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Procedure for Visual Evaluation of Prairie Dog Colonies for Plague in the Southwestern United States by the Centers for Disease Control

Source: Ensore, R. Centers for Disease Control and Prevention, NCID, Division of Vector Borne Infectious Diseases, Plague Section, Fort Collins, Colorado.

HEALTHY COLONY

OBSERVATION: The vast majority of burrows show signs of recent use, unless it has rained within the past 24 hours – in which case the colony should be reexamined following a period of at least 24 hours without precipitation. Active prairie dogs are observed during periods of acceptable weather conditions. Only a relatively few (<10%) burrow openings appear inactive (lack of disturbed soil, presence of cobwebs or wind-blown vegetation over the entrance). An occasional carcass or dried bones may be present as a result of non-plague death or predation.

EVALUATION: Unless recently (days) introduced, plague is not likely to be present. Fleas are not likely to test positive.

SAMPLE RECOMMENDATIONS: No samples recommended.

DEAD COLONY

OBSERVATION: The colony appears completely inactive. Burrows show no signs of recent use (re-examine if it has rained within 24 hours). An occasional desiccated carcass and bones may be present, and have likely been scavenged.

EVALUATION: 1) Make inquiries to determine if the colony was poisoned. This is especially likely if it appears that dirt was shoveled into the burrows. If there is no evidence of poisoning and the food supply appears ample: 2) it is likely that plague or some other zoonotic disease killed the colony. An experienced observer can usually make an estimate (recently, 1 season, or 2 seasons) on how long the colony has been inactive by considering the soil type and degree of burrow degeneration.

SAMPLE RECOMMENDATIONS: Sample only if there is no evidence of poisoning. A recent (same season) die-off might produce many fleas through burrow swabbing. Older die-offs would likely produce few or no fleas. Typically, many burrows (dozens or even hundreds) may be swabbed with only a few producing fleas. If burrowing owls are using the inactive burrows, small black stick-tight fleas may be present in large numbers (in contrast to the larger, reddish-brown prairie dog fleas). Fresh or desiccated prairie dog carcasses may also be collected for analysis.

SCATTER PATTERN:

OBSERVATION: Inactive burrows constitute an unusually high (typically 20-90%) percentage of the total burrows. Active burrows however are clearly evident and active prairie dogs are observed during periods of acceptable weather. Active and inactive burrows are scattered amongst each other in no particular pattern (see below), keeping in mind that family units may have multiple burrow openings and hence an inactive unit may produce a small cluster of 2-5 inactive burrow openings. An occasional carcass (fresh or desiccated) and bones may be present.

EVALUATION: Several scenarios could account for these observations – and more than one scenario may be in play at the same place and time. Presented in order of likelihood: 1) make inquiries to determine if the colony was poisoned. This is especially likely if it appears that dirt was shoveled into the burrows. This scatter pattern could be produced if the application of poison was scattered and not comprehensive, 2) if there is no evidence of poisoning, assess the available food supply. Such a pattern of death could also be attributable to a population crash as a result of lost carrying capacity of the site or over-population, 3) if there is no evidence of poisoning or population crash, hunting by humans or excessive predation by carnivores or birds of prey are highly likely. Human hunting usually produces physical evidence such as footprints, tire tracks and spent ammunition shells. Depending upon the local culture, human hunters may collect their prey (many Native American groups regard prairie dogs as a delicacy) or leave it for scavengers. Experienced observers can often spot carnivore tracks and recognize hunting and attack patterns in these tracks near burrow entrances, 4) finally, a zoonotic disease could be responsible, but given this mortality pattern, a disease with a lower mortality rate than plague is more likely.

SAMPLE RECOMMENDATIONS: If there is no evidence of poisoning, population crash, or excessive human hunting: collect fleas by swabbing burrows – especially inactive burrows – and collect fresh or desiccated prairie dog carcasses if available.

DEAD ZONE

OBSERVATION: Within an otherwise healthy appearing colony, there is a zone of inactive burrows. This zone may encompass a relatively small or large proportion of the colony, and may be located anywhere in the colony. Eventually it spreads to encompass a section of the colony and appears to be spreading, along a discernable line of demarcation, over the remaining section of the colony. Experienced observers can often clearly distinguish and mark (flagging tape) this demarcation line between active and inactive regions. Marking allows for periodic re-examination to assess the rate of spread and facilitates sampling. Fresh or desiccated carcasses may be present. Near the demarcation line, recently inactive burrows may reveal the odor of decaying carcasses and flies may be common at burrow entrances.

EVALUATION: 1) There is a high probability that plague is active in such a colony. Although other zoonotic diseases are possible, plague is most likely. 2) Depending upon the location of the dead zone with respect to other human activity (homes, barns, etc.) poisoning is also a possibility and should be investigated.

SAMPLE RECOMMENDATIONS: Collect fleas by swabbing burrows immediately along both sides of the demarcation line, concentrating a majority of your efforts immediately along (within 10meters) the inactive (dead) side of the line. Fleas are likely to be numerous. You may wish to apply extra insect repellent but be extremely cautious not to directly or indirectly get repellent on your burrow swab! (If this happens: discard it, wash your hands, and start with a new one). If others in a group are getting fleas and you are not, and you are swabbing essentially the same area, you likely have repellent on your swab. Collect any available rodent carcasses (fresh or desiccated, prairie dog or other rodent) for testing.

Additional Notes: Please include GPS coordinates for all samples. One set of coordinates per colony is acceptable. Specify the type of inactivity pattern noted for each sampled colony: dead colony, scatter pattern, dead zone. Analysis of samples from “dead zone colonies” would receive laboratory priority.

The above activity patterns are typical for the warm months. Visual examination during winter months is more difficult due to decreased daily activity among even healthy animals.

Literature Cited:

Enscore, R. Undated. Visual examination of prairie dog colonies for plague in the southwestern U.S. Centers for Disease Control and Prevention, NCID, Division of Vector Borne Infectious Diseases, Plague Section, Ft. Collins, CO. Personnel Communication. 3pp.

Field Procedures for Collecting and Handling Carcasses as Diagnostic Specimens by the Centers for Disease Control

Search prairie dog colonies systematically by walking transects spaced at about 50 meters.

When a carcass is discovered, ascertain, if possible, whether or not the animal was shot. If mortality by shooting is confirmed, there is no need to collect the specimen.

Before you collect a carcass, prepare a tag with the following information: species, date, location (both legal description and UTM is recommended), name of collector, agency or affiliation of collector, telephone number and address of collector, and a brief description of circumstances for collection.

When collecting a carcass, the collector should wear leather or latex gloves, and a long sleeved shirt or jacket that is tight at the wrist, to ward off fleas.

Invert a one-gallon plastic ziplock freezer bag over your hand, grasp the carcass in your hand, quickly fold the bag over the carcass, roll the bag on the ground, away from your body, to expel the air, and seal the ziplock.

Immediately place in a second ziplock bag, put in the tag, roll and seal the second bag.

As soon as possible after collection, freeze the specimen.

8. Sample Size:

A) If specimens are from a single sample area (one prairie dog colony or area), collect as many specimens as is practical up to 15, but initially ship only the freshest five specimens to the diagnostic lab.

B) Freeze the additional specimens that were collected, up to ten, and save for further testing needs, depending upon the results from the testing of the first five specimens. Keep the samples until notified by the lab that results were obtained from the first five samples and that the additional specimens would not be needed.

9. Ship the frozen specimen to CDC, or designated lab.

(DO NOT USE UPS). U.S. Postal System or FedEx can ship carcasses that are sealed in plastic bags and a cardboard box. Their regulations require:

A) Carcasses must be individually labeled and bagged in watertight bags (minimum triple bag in ziplock bags).

B) Placement of absorbent packing material around the carcass (crumpled newspaper, etc.).

C) Use of approved laboratory shippers or hard-sided containers, adequately taped closed.

D) Marking of the container with “Biomedical Material” label (for U.S. Postal Service) or shipped as hazardous material by Federal Express (requires a special form and should be labeled as Diagnostic Biomedical Material on the form. Labels and forms may be obtained from the U.S. Postal Service or FedEx.

E) Carcasses should be frozen or packed with frozen ice packs (no wet ice).

10. Cost: CDC testing is free but the Ft Collins laboratory has limited capacity and can handle no more than 50 specimens per year.

11. Contact before shipping:

(Shipment by U.S. Postal System)
CDC/Bacterial Zoonoses Branch
c/o Mr. John Young
P.O. Box 2087
Ft. Collins, CO 80522

(Shipment by FedEx)
CDC/Bacterial Zoonoses Branch
c/o Mr. John Young
Rampart Road (CSU Foothills Campus)
Fort Collins, CO 80521

Procedure for Flagging (Swabbing) Rodent Burrows by the Centers for Disease Control

Source: Gage, K. Centers for Disease Control, Ft. Collins, CO.

John Young: 970-221-6444 (jyoung2@cdc.gov)
 Marty Schriefer: 970-221-6479 (mschriefer@cdc.gov)
 Ken Gage: 970-221-6450 (Plague Section Chief - Responsible for CDC's plague surveillance and control program. Trained as a medical entomologist/zoologist)
 Rusty Ensore: 970-221-6452 (Environmental Health Specialist IV, Plague Section – Registered Sanitarian)
 John Montenieri: 970-221-6457 (Biological Technician, Plague Section - GIS specialist)

Some important flea vectors of plague infest rodent species that live in burrows. Although these fleas usually can be found in abundance on live hosts, they also can be collected by a procedure known as burrow flagging or burrow swabbing.

This procedure requires:

- 1) Burrow swabbing device consisting of a flexible cable, wire, or strong rubber hose with spring-loaded clip attached to the end. We prefer a steel plumber's "snake" that has an alligator clip attached to (screwed onto) the end as a means of attaching the flag. A simple burrow swab can be made by attaching a flag to the end of a piece of wire (about the thickness of a coat hanger), but this primitive swab allows only the top 2 or 3 feet of a burrow to be swabbed and will miss some fleas. Despite the shortcomings of the latter technique, it can be useful when die-offs are encountered unexpectedly and more sophisticated means of swabbing fleas are not available.
- 2) Flags consisting of white flannel cloth squares (approx. 25 cm² or 10 in²). We prefer white flannel because it is easier to see the fleas on white cloth than on cloth of other colors. Flannel is better than most other cloth because of its deep nap, which increases the likelihood that fleas will continue to cling to the cloth flag after it is removed from the burrow.
- 3) Plastic bags (approx. 20-40 cm² or 8-15 inches) (ziplock type are best)
- 4) Insect repellent (DEET) to spray on clothes and exposed skin on arms, legs, etc. Although this is recommended for safety reasons, care must be taken not to apply repellents to hands because the repellent is likely to transfer to the flagging material, thus preventing fleas from jumping onto the flag. Note: clothing also can be treated with permethrin-containing sprays but these sprays should not be applied directly to the skin.

Procedure:

Attach a flag to the clip on the end of the burrow swab.

Slowly insert the flag as far as possible down the burrow. The fleas confuse the flag with their normal host and cling to it as it passes through the burrow.

Slowly withdraw the flag from the burrow after approximately 30 seconds.

Quickly place the flag in a plastic bag.

Seal the bag to prevent the fleas from escaping.

Keep track of the number of burrows swabbed so that a burrow index can be calculated.

Burrow index = no. fleas collected/no. burrows sampled - This value often increases dramatically during die-offs among prairie dogs, rock squirrels, California ground squirrels, or other ground squirrel species.

Place another flag on the swab and repeat steps 1-6 for each burrow.

Transport flags back to laboratory in the plastic bags. Keep the bags in a reasonably cool place to prevent desiccation of the flea samples (*Yersinia pestis* is very susceptible to death by desiccation) or death of the plague bacilli due to excessive heat (remember automobile hoods can get very hot in direct sunlight! Fried samples will come back negative for plague every time!).

Place bags in a freezer overnight to kill the fleas.

Place the flags and loose contents of the plastic bags in a white enamel pan. Fleas may be picked from the flags and bottom of the pan with forceps.

Place fleas in vials containing 2% saline and a very small amount of Tween-80 detergent (<0.0001% of solution). Remember that the detergent is added to reduce surface tension and allow the fleas to sink to the bottom of the vial. Too much detergent will kill the plague bacteria and prevent successful isolation. Fleas can be submitted in 2% saline without Tween-80, but an effort should be made to submerge the fleas. If the fleas have been killed by freezing, this should not be a problem. Although not recommended for routine collecting, some investigators occasionally remove live fleas directly from the flags and place them in vials of saline. Live fleas placed in saline containing the Tween-80 detergent will be unable to float on the surface of the liquid, thus ensuring that they will drown soon after being placed in the saline. Without the detergent, surface tension can become a problem because the numerous bristles and setae found on fleas enable them to remain afloat on the surface of saline. This can be a potential safety problem because floating fleas often survive shipment and arrive at the laboratory ready to jump onto lab personnel. Rapid freezing of the fleas obviously eliminates this problem, but adding Tween-80 to the saline also helps reduce the growth of fungi on flea samples. Dead fleas trapped in the surface

tension at the air-saline interface rapidly become overgrown with fungi making identifications more difficult.

Vials containing 2% saline and fleas can be shipped to CDC for taxonomic identification and analysis of the fleas for *Yersinia pestis* infection. The fleas can be shipped at ambient temperature in the vials of 2% saline. For best results, ship the specimens as soon as possible because the fleas will start to decay soon after collection. Be sure and double wrap the vials in a leak-proof material and then place them in a crush-proof box or metal mailing tube for shipment to CDC.

CDC Address by U.S. Postal System:
CDC/Bacterial Zoonoses Branch
c/o John Young
P.O. Box 2087
Ft. Collins, CO 80522

Shipment by FedEx:
CDC/Bacterial Zoonoses Branch
c/o John Young
Rampart Road (CSU Foothills Campus)
Fort Collins, CO 80521

Literature Cited:

Carter, L., K. Gage, R. Ensore, and J. Montenieri. Undated. Procedure for flagging (swabbing) rodent burrows. Centers for Disease Control – Bacterial Zoonoses Branch, Ft. Collins, CO. 3pp.

Gage, K.L. Undated. Procedure for Flagging (Swabbing) Rodent Burrows. Centers for Disease Control. Personnel Communication. 3pp.

Seery, Dave. pers. comm. U.S. Fish and Wildlife Service, Rocky Mountain Arsenal National Wildlife Refuge, Commerce City, Colorado, phone 303-289-0537.

Young, P.J., D.J. Mead, F. Ramberg, K.M. Canestorp, and T. Vosburgh. Undated. Plague surveillance and flea communities on black-tailed prairie dog towns (abstract only).

Appendix C: Devils Tower National Monument Standard Operating Procedures for Plague Monitoring and Response

Devils Tower National Monument Standard Operating Procedures for Plague Monitoring and Response

Plague Outbreak and Treatment in prairie dog colonies Standard Operating Procedure (Updated 09-07-2010)

This document identifies standard operating procedures for collection of biological samples, treatment of prairie dog colonies with pesticide, notification of cooperating agencies, and posting warning and closure signs when outbreaks of sylvatic plague occur.

- XII. Background
- XIII. Purpose and Need
- XIV. Monitoring the Black-tailed Prairie Dog Population and Occurrence of Fleas that Inhabit Prairie Dog Burrows
 - a. Black-tailed Prairie Dog Monitoring
 - b. Flea Monitoring
- XV. If an Outbreak of Plague is Suspected: Collecting, Handling, and Shipping Prairie Dogs
 - a. Black-tailed Prairie Dog Sample Collection
 - b. Flea Sample Collection
 - c. Burrow Dusting Protocol
 - d. Communication Protocol
- XVI. Detection Determination
 - a. If Plague IS NOT Detected
 - b. If Plague IS Detected
- XVII. Literature Cited
- XVIII. Plague SOP Flow Chart
- XIX. Material Safety Data Sheet – Deltamethrin
- XX. Prairie Dog Mortality/Flea Collection Data Sheet
- XXI. Three Sample Signs for Posting in Areas of Plague Detection
- XXII. Sample Press Release

I. Background

The black-tailed prairie dog is listed as a species of concern in the state of Wyoming due to drastic reductions in its numbers, loss of suitable habitat, plague and other human factors in 1973. The black-tailed prairie dog has had a continued presence in Devils Tower National Monument (DETO) for at least 100 years. During the last twenty years, the number of prairie dogs in the Monument has averaged between 500 and 1000 animals. In order to monitor the population and distribution in the Monument and determine population trends and individual colony variations, it is imperative to conduct visual counts throughout the summer on an annual basis. These numbers contribute to the overall counts of prairie dogs in the Devils Tower area.

Plague has never been demonstrated to exist in the black-tailed prairie dog population in Devils Tower National Monument. However, plague is known to occur in black-tailed prairie dogs in Wyoming. The plague might have arrived naturally to North America during the Pleistocene via the Siberian-Alaskan land bridge. More likely however, the plague was

introduced about 100 years ago via flea-infested rats from Asian and European ships (Barnes 1993; Biggins and Kosoy 2001). Therefore it is considered a non-native organism and is subject to NPS policies for non-native species. The plague is caused by a bacterium (*Yersinia pestis*) and fleas are the most common vectors in the spread of the disease. Therefore the removal of fleas from colony areas during an observed plague outbreak may well stem the spread of the disease to other dogs in the colony. Some species of animals are highly or moderately resistant to plague, however, prairie dogs are highly susceptible, probably because they have not had sufficient time to evolve a defense against this introduced disease (Cully and Williams 2001). Plague is primarily transmitted via flea vectors, though carnivores can also be exposed through consumption of infected prey. Studies have demonstrated that many species of flea can transmit the disease and some species can survive for years in abandoned prairie dog burrows (Fagerlund et al. 2001, Padovan 2006).

II. Purpose and Need

Sylvatic and bubonic plague are different names for the same disease. When the disease occurs in humans, it is referred to as bubonic plague. When it occurs in wildlife, it is referred to as sylvatic plague. This plague outbreak action plan would outline steps that should be followed and contacts that should be made both within the Monument and with other agencies should plague be detected in Devils Tower National Monument. Prompt and proper action would be necessary to prevent the spread of this disease to protect not only human health, but also the population of black-tailed prairie dogs within Devils Tower National Monument.

III. Monitoring the Black-Tailed Prairie Dog Population and Occurrence of Fleas That Inhabit Prairie Dog Burrows

A. Black-tailed Prairie Dog Monitoring

Currently, Devils Tower National Monument has a plan in place for the weekly monitoring of the prairie dog population throughout the summer. *Any die-offs of prairie dogs or observations of prairie dogs acting abnormally are to be reported immediately to Monument Resource Management staff or Law Enforcement ranger.* That Resource Management or Law Enforcement employee should then notify the Superintendent of the possibility of a plague outbreak. Monument Resource Management staff would then proceed to the area of the suspected outbreak, collect any available dead prairie dogs (see section “IV.A. Black-tailed Prairie Dog Sample Collection” for details on how to safely collect suspected plague-killed prairie dogs), and send them to a laboratory for testing to determine cause of death. A plague SOP flow chart is included in section VII below.

B. Flea Monitoring

Flea sampling would not occur on a regular basis such as does the prairie dog monitoring. When a suspected plague outbreak occurs, any dead prairie dogs would be collected as well as fleas in the area of the burrow. These samples would then be shipped to a laboratory for testing to see if they are carrying the plague or not (see section “IV.B. Flea Sample Collection” for details on how to safely collect and store collected fleas).

IV. If an Outbreak is Suspected: Collecting, Handling, and Shipping Prairie Dogs and Fleas

A. Black-Tailed Prairie Dog Sample Collection

If plague is suspected in the deaths of large numbers of black-tailed prairie dogs, it is imperative to collect as many viable specimens (whole animals) as possible and ship them to the Center for Disease Control laboratory in Fort Collins, Colorado, for analysis and clarification as to what actually killed the animals. Shipments should be kept to 5 dead black-tailed prairie dogs at one time. Collect as many specimens as is practical up to 15. If more than 5 dead black-tailed prairie dogs are collected at one time, keep the remaining dead animals in the resource management freezer in the basement of the Ranger Station for further testing needs, depending upon the results from the testing of the first five specimens. Keep the samples until notified by the lab that results were obtained from the first five samples and that the additional specimens would not be needed.

Materials you would need:

Data sheets	Gloves (leather or latex)
Large zip-lock freezer bags	Long sleeve shirt
Tags	Pants
Crush-proof shipping box	Insect repellent (with DEET)

As per the head of the CDC, Plague Section in Fort Collins, Colorado (Dr. Ken Gage), this is the absolute minimum personal protective equipment (PPE) that you would need to wear. However, if you feel safer wearing more PPE than suggested here (e.g., face mask, goggles, Tyvek suit, etc.), that is acceptable and encouraged.

When going to collect dead prairie dogs:

Prepare, review, and sign a Job Hazard Analysis (JHA) for this activity in consultation with the regional Safety officer, CDC, and NPS Public Health personnel.

Ensure staff have all appropriate required and recommended PPE to safely carry out this job.

Apply an insect repellent that contains DEET to your exposed skin and clothes. This would prevent fleas that may jump off of the dead animal from remaining on you and potentially transmitting the plague virus to you when they make their next blood meal (i.e., YOU!). You can also use a pyrethrin-containing powder (Deltamethrin), if available to dust your clothes; this would also keep fleas off of your body (see section VIII for MSDS sheet for Deltamethrin information). If you are collecting fleas, be careful to keep the powder (Deltamethrin) off of the collection rag.

Before you collect a carcass, prepare a tag with the following information: carcass number, species, date of collection, estimated date of death, location (both legal description and UTM is recommended), county, state, name of collector, agency or affiliation of collector, telephone number and address of collector, and a brief description of circumstances for collection. Also include this information on a Prairie Dog Mortality Data Sheet (Section IX). This would assist in matching up the results in the unlikely event of a mix-up at the testing facility or in the packaging of the animals.

Next, take one of the large zip-lock freezer bags, turn it inside out, and insert your gloved hand into the bag. Grasp the carcass in your hand, quickly fold the bag over the carcass, roll the bag on the ground, away from your body, to expel the air, and seal the ziplock.

Immediately place in a second ziplock bag, put in the tag, roll and seal the second bag.

As soon as possible after collection and bagging, put the animal in the resource management freezer in the basement of the Ranger Station.

Preparing prairie dogs for shipping:

Select a biological sample shipping box that is constructed of heavy duty, crush-proof cardboard and has a solid Styrofoam container inside (found in resource management storage area, B24).

Carcasses must be individually labeled and bagged in a minimum of 3 ziplock bags. Be sure that all frozen prairie dog bags still have the tags attached.

Next, make copies of the data sheets. Put the originals in an envelope inside a zip-lock bag, and place in the shipping box on top of the bagged dogs.

Pack absorbent packing material around carcasses (crumpled newspaper, etc).

Carcasses should be frozen or packed with frozen ice packs or dry ice (no wet ice).

Seal the box with clear packing tape.

Before shipping the samples, call Dr. Ken Gage (970-221-6450) to inform him that we are shipping some samples to his lab. You should also notify George Larson (Public Health Officer) of PHS-NPS at Yellowstone National Park (307-344-2273) of what is going on and that we would begin treatment of burrows with Deltamethrin (see below), so he can respond appropriately.

If shipping U.S. Postal Service, mark the container with "Biomedical Material and ship to:
CDC/Bacterial Zoonoses Branch
c/o Mr. John Young
P.O. Box 2087
Ft. Collins, CO 80522

If shipping FedEx, mark the container "Diagnostic Biomedical Material" and ship as hazardous material (requires a special form). Ship to:

CDC/Bacterial Zoonoses Branch
c/o John Young
Rampart Road (CSU Foothills Campus)
Fort Collins, CO 80521

Shipping by FedEx Overnight is the best way to get the samples to the lab. Shipments via FedEx are to be coordinated with the mail clerk.

B. Flea Sample Collection

If plague is suspected in the deaths of large numbers of black-tailed prairie dogs, it is imperative to collect as many viable flea specimens as possible and ship them to the Center for Disease Control laboratory in Fort Collins, Colorado, for analysis and clarification as to what actually killed the animals.

Materials you would need:

Insect repellent (with DEET)	Collection vials
Plumber snake	Saline
White flannel cloth (approx. 10 in ²)	Collection forms
Large zip-lock freezer bags	Long sleeve shirt
Tweezers	Pants
Gloves	Crush-proof shipping box
Tyvek suit is also acceptable PPE for keeping fleas off of your body	

As per the CDC-Plague Section in Fort Collins, Colorado (Dr. Ken Gage), this is the absolute minimum PPE that you would need to wear. However, if you feel safer wearing more PPE than suggested here (e.g., face mask, goggles, etc.), that is acceptable and encouraged.

When going to collect fleas:

Prepare, review, and sign a JHA for this activity in consultation with the regional Safety officer, CDC, and NPS Public Health personnel (see section XII for JHAs).

Ensure staff have all appropriate required and recommended PPE to safely carry out this job.

Apply an insect repellent that contains DEET to your exposed skin and clothes. This would prevent fleas that may jump off of a dead prairie dog from remaining on you and potentially transmitting the plague virus to you when they make their next blood meal (i.e., YOU!). You can also use a pyrethrin-containing powder (Deltamethrin), if available to dust your clothes; this would also keep fleas off of your body. HOWEVER, be careful to keep the powder (Deltamethrin) off of the collection rag so as not to kill the fleas you are collecting in this manner.

Next, make sure to sample from burrows that appear active, or where dead prairie dogs have been collected/observed. Attach the cloth to the alligator clip on the end of the plumber's snake. Slowly insert the cloth as far as possible into the burrow and allow it to remain in the burrow for about 30 seconds. Have a large zip-lock freezer bag ready. Slowly withdraw the cloth, immediately place it in the bag, and secure the top with your gloved hand.

Holding the bag closed, squeeze the alligator clip to release the cloth. Pull the cable from the bag and zip the closure on the bag to close it. Repeat this procedure with different

cloths and bags at as many burrows as seems prudent based on the amount of die-off observed. It is imperative to get as representative a sample as possible, instead of sampling from only a few burrows in the affected colony.

Be sure to label the bags with the location of collection, date of collection, name of collector, county and state in which they were collected.

Keep track of the number of burrows swabbed so that a burrow index can be calculated. Burrow index = no. fleas collected/no. burrows sampled - This value often increases dramatically during die-offs among prairie dogs.

When done collecting the fleas, transport bags back to laboratory in the plastic bags. Keep the bags in a reasonably cool place to prevent desiccation of the flea samples (*Yersinia pestis* is very susceptible to death by desiccation) or death of the plague bacilli due to excessive heat (Remember pick-up hoods can get very hot in direct sunlight! Fried samples will come back negative for plague every time!).

Place the bags in the resource management freezer located in the basement of the Ranger Station overnight to kill the fleas.

To prepare the fleas for shipping:

After 24–48 hours in the freezer, the fleas should be dead, and they can be sorted. You would need: a metal tray or some other light-colored background to work on, tweezers, collection vials, and saline. Fill out the Prairie Dog Mortality/Flea Collection Data Sheet (Section IX) as you go along. This is the same data sheet you fill out when collecting dead prairie dogs. The data sheet has spaces for date collected, date picked, and location descriptions. For best results, ship the specimens as soon as possible because the fleas will start to decay soon after collection.

Starting with a bag collected at one location, empty the bag onto your tray or light-colored background, ensuring that every bit of dirt, etc., comes out of the bag.

Pick up the cloth and carefully examine it for fleas on both sides. Fleas are usually 1/16–1/8" long, and brownish-red in color, with long back legs. They often look shiny. Run your fingers down the cloth to brush off any debris clinging to it, and put it back in its bag.

Now, examine the tray to see what fell off the cloth or out of the bag. Often, most of the fleas are found here in the tray. If fleas are found, pick them up with the tweezers and place them in a vial. Label the vial with the same location as was on the bag.

Empty the tray between each sample bag.

For each sample, write on the data sheet the number of fleas found, even if it is zero.

Once all the bags have been gone through, fill each vial with 2% saline and a very small amount of Tween-80 detergent (<0.0001% of solution) to preserve the fleas. Remember that the detergent is added to reduce surface tension and allow the fleas to sink to the bottom of the vial. Too much detergent will kill the plague bacteria and prevent successful

isolation. Fleas can be submitted in 2% saline without Tween-80, but an effort should be made to submerge the fleas. If the fleas have been killed by freezing, this should not be a problem. Dead fleas trapped in the surface tension at the air-saline interface rapidly become overgrown with fungi making identifications more difficult. Cap them tightly and place duct tape or electrical tape around the lids to ensure a tight seal.

Wrap the taped vials in bubble wrap and place in a crush-proof box with blue ice or dry ice and absorbent material in case the vial breaks or leaks.

Place all the sealed vials into a crush-proof mailing box. Make copies of the data sheets. Put the originals in an envelope inside a plastic bag and place inside the shipping box.

Seal the box with clear packing tape and label it "DIAGNOSTIC SPECIMENS."

Prior to shipping the samples, give Dr. Ken Gage a call to inform him that we are shipping some samples to his lab. Dr. Gage's phone number is 970-221-6450. You should also notify George Larson (Public Health Officer) of PHS-NPS at Yellowstone National Park (307-344-2273) of what is going on so he can be ready to respond if plague is detected from the samples.

If shipping U.S. Postal Service, mark the container with "Biomedical Material" and ship to:
CDC/Bacterial Zoonoses Branch
c/o Mr. John Young
P.O. Box 2087
Ft. Collins, CO 80522

If shipping FedEx, mark the container "Diagnostic Biomedical Material" and ship as hazardous material (requires a special form). Ship to:

CDC/Bacterial Zoonoses Branch
c/o John Young
Rampart Road (CSU Foothills Campus)
Fort Collins, CO 80521

Shipping FedEx Overnight is the best way to get the samples to the lab. Shipments via FedEx should be coordinated with the administrative mail clerk.

C. Burrow Dusting Protocol

If plague is suspected in the deaths of the prairie dogs, then Resource Management staff would immediately start treatment of affected burrows before any test results come back, but after sample collection is completed. As per DO12 handbook Chapter 3 Section 4 E (3), which states, *Removal of individual members of a non-threatened /endangered species or population of pests and exotic plants that pose an imminent danger to visitors or an immediate threat to park resources*, we have the authority to act in such a manner. The following protocol should be followed.

Notify George Larsen (Public Health Officer) of PHS-NPS at Yellowstone National Park (307-344-2273) to apprise him of our decision to apply pesticide to the burrows and the methods we would use to accomplish the task.

Until we hear back from the CDC or Public Health Department, Resource Management staff should dust the affected burrows (those where dead prairie dogs were found) with insecticidal dust (Deltamethrin). Not all burrows in a colony would need to be treated. If the affected burrows occur within 100 feet of an area that receives frequent use by visitors or staff, all burrows within 100 feet of the frequent-use area should receive treatment. Burrows not treated should be monitored in the event that dead prairie dogs begin appearing in or around them. If this occurs, then these burrows should be treated, and the 100-meter radius area should be treated.

A store of bubonic plague warning or closure signs would be kept on hand in the basement of the Ranger Station. Deltamethrin would not be purchased and stored on site. Local sources to purchase Deltamethrin from would be identified and verified each spring so that it can be ordered and on hand in less than one day when needed. Personal protective equipment, including respirators, goggles, disposable coveralls, and gloves, is located either in the resource management storage area or in cold storage in the Maintenance Building. Disposable face shields should be used for each dusting event. It is also important to wear full PPE (pants, long sleeve shirts, chemical resistant gloves, Tyvek suit, face shield, and goggles) when applying the Deltamethrin. Care should be taken when applying the insecticide on windy days to prevent the dust from blowing toward the person applying it.

A hand-held duster or shaker-can would be located in the resource management storage area with all other materials associated with prairie dog management activities. No applicator certification is required to apply Deltamethrin; however, it is advised that the person applying the powder be familiar with all safety protocol, and take the necessary steps to prevent being exposed to the powder and ensure that the NPS IPM coordinator is notified.

Materials you would need:

Appropriate PPE (face mask, chemical resistant gloves, Tyvek suit, eye protection)

Deltamethrin pesticide

Backpack sprayer or shaker can

Insect repellent

To apply the Deltamethrin:

Prepare, review, and sign a JHA for this activity in consultation with the regional Safety officer, CDC, and NPS Public Health personnel (see section XII for JHAs).

Ensure staff have and wear all appropriate required and recommended PPE to safely carry out this job.

Fill the shaker can or hand-held duster to the appropriate level with Deltamethrin.

Thoroughly apply the dust to adequately cover the mound and around the mound's perimeter (18" from outer edge). Approximately 4 grams of Deltamethrin are required to treat a single burrow (D. Biggins, Pers. Commun.).

Re-apply once a day for 5 days for light rodent populations.

D. Communication Protocol

All research and other human activity in close proximity to the affected burrows should be immediately suspended until the extent of the outbreak is defined and treatment efforts have been completed.

Until we hear back from the CDC or Public Health Department, Law Enforcement staff should mark the affected area with warning/closure signs (See Section X. for sample closure signs).

A draft press release is below (Section XI) for disseminating information to the public and NPS and concession employees. Simply fill in the dates, and what closures, if any, have been enacted. This information should be immediately communicated to the Public Information Officer or Superintendent's designee for release to the media. A briefing statement to provide information on the location of the outbreak, actions we are implementing, and the phone number of the Chief of Resource Management should be included in the release. The Monument's Superintendent should develop this briefing with input from Resource Management staff. The Superintendent would handle dissemination of information to the media. It is important to get the information out to the public early, before rumors start to develop.

A copy of the warning/closure signs (Section X.) should be distributed to interpretive staff at the visitor center (VC), Entrance Station, and Monument information boards along with information pertaining to the event so it can be passed on to visitors. Contact the on-duty law enforcement ranger and arrange for a meeting with campground hosts. They should be briefed in order to provide the public and campers with accurate information, including orders to stay out of the colonies and to keep their pets inside or on leashes away from prairie dogs. Information regarding other animals that can also harbor the plague organism should also be disseminated to the public so visitors do not contract plague while attempting to feed ground squirrels, chipmunks, or other rodents. The intent of this meeting should be to inform, NOT to alarm people!

Law Enforcement personnel should be notified to strictly enforce the leash law so as to prevent spreading the disease to domestic pets and then to humans.

Signs should be posted at campground entrances, at all loop entrances, and at the entrances of both men's and women's restrooms.

V. Detection Determination

A. If Plague is NOT Detected

If plague is not detected, your efforts have not been in vain. Hopefully, along with the negative plague results there would be a report specifying what, if any, cause of death was

detected from the lab tests. If die-off is still occurring, it would be advisable to continue to collect prairie dog and flea samples and ship them to the CDC in case the plague organism was simply not detected in the previous samples, or in order to determine what is actually killing the prairie dogs.

B. If Plague IS Detected

If the lab report comes back with positive results for the plague, then immediately notify the Superintendent, all Monument personnel, and call NPS Public Health Officer George Larson at 307-344-2273. John would respond, conduct a site visit to the affected colony, and make recommendations as to potential closures in conjunction with the Superintendent and Resource Management staff, depending on where the colony is located relative to human activity. He would also make recommendations regarding whether or not it is necessary to dust the burrows with Deltamethrin. It may be necessary to issue a press release to describe the situation and explain why closures are going into effect.

If plague is verified, the resource manager, in cooperation with NPS public health officials and CDC, should immediately notify, and make plague contingency recommendations to, the following: landowners and wildlife agency personnel in the affected area, state Department of Agriculture, USDA-Wildlife Services, NRCS, veterinarians, and local government personnel that deal with animal control, and the general public through local media sources. The NPS public health officials and CDC should be consulted on the need for insecticide treatment at this time to control fleas in burrows, and therein reduce the potential for further plague infections.

When the Public Health Department's representative arrives at the Monument (usually 18–24 hours after being notified of a positive outbreak), they should meet with Division Chiefs to be briefed on the actions taken. Once the assessment has been completed, the course of action to be followed should be determined with all members of the leadership team and the Public Health representative.

If, at any time of the assessment, the public health representative recommends the closure of any facilities, the posting of closure signs would be initiated immediately. Closures should be made on a site-by-site basis.

The continued monitoring of the colonies in and around the Monument for further prairie dog die-offs would be crucial in determining the spread, or lack thereof, of the plague outbreak. If animals in other colonies begin to die off then sampling should be conducted to verify if plague is the causative agent or not.

The outbreak would be considered contained when no more prairie dog die-off is observed and when the Monument receives direction to lift restrictions from the Public Health Officer. At that time, all closed or restricted access areas would be reopened, closure signs would be removed and replaced with warning signs, and Resource Management personnel would continue to monitor the affected colony for prairie dog die-off. The re-initiation of any suspended activities in the area of the affected colony would be reassessed and decisions made by the Monument management team in conjunction with the Public Health Officer.

Post-plague monitoring of prairie dog colonies should be conducted annually in March or April (or more frequently, if possible) to document the rate of re-colonization and verify occupied acreage. Initial monitoring, which would take place from one to several years, should consist of windshield surveys. When visual surveys indicate prairie dog colonies are recovering, a quantitative survey method should be initiated. The recommended method, due to widespread use, particularly on black-footed ferret reintroduction sites, is transecting using the Biggins method (Biggins et al., 1993) that equates active and inactive burrow densities to population density.

The resource manager and staff should evaluate the extent of the impact of the epizootic as it affects the acreage and distribution objectives in the management plan. The group should determine whether or not there is a need to modify prairie dog management in the plague area, and potentially elsewhere in the Monument, if occupied acreage is below the objectives in the management plan.

VI. Literature Cited

Barnes, A.M. 1993. A review of plague and its relevance to prairie dog populations and the black-footed ferret. Pages 28-37 in Proc. of the Symp. on the management of prairie dog complexes for the reintroduction of the black-footed ferret. U.S. Dept. of Interior, U.S. Fish and Wildlife Serv. Biol. Rept. 13.

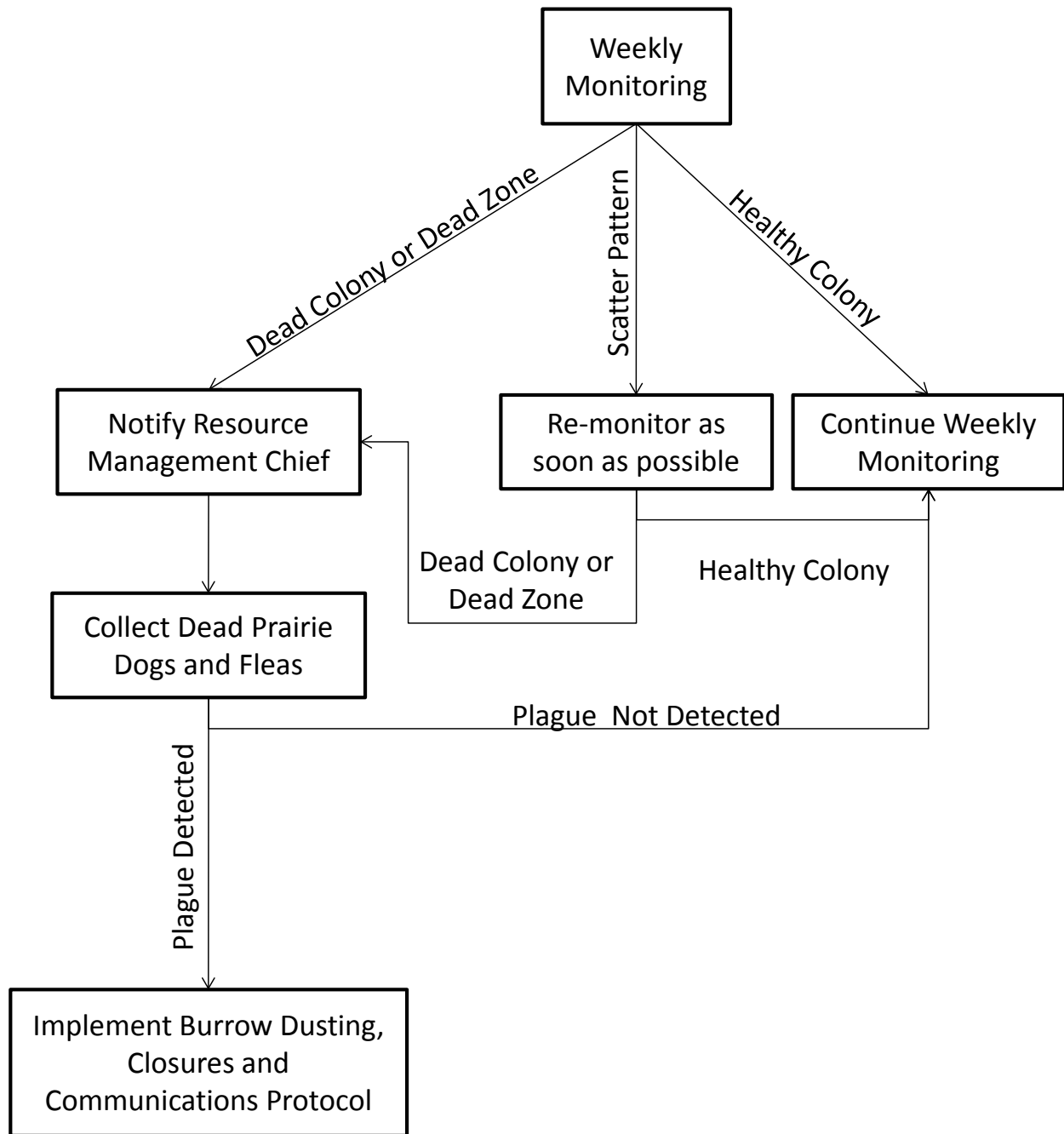
Biggins, D.C., B.J. Miller, L.R. Hanebury, B. Oakleaf, A.H. Farmer, R. Crete and A. Dood. 1993. A technique for evaluating black-footed ferret habitat in Management of prairie dog complexes for reintroduction of the black-footed ferret, U.S. Fish and Wildlife Service, Biological Report 13.

Cully, J. F., Jr. and E. S. Williams. 2001. Interspecific comparisons of sylvatic plague in prairie dogs. *Journal of Mammalogy* 82(4): 894-905.

Fagerlund, R.A., P.L. Ford and P.J. Polechla, Jr. 2001. New records for fleas (Siphonaptera) from New Mexico with notes on plague-carrying species. *Southwestern Naturalist* 46: 94-96.

Padovan, D. 2006. *Infectious Diseases of Wild Rodents*. Corvus Publishing Co, Anacortes Washington.

VII. Plague SOP Flow Chart.



VIII. Material Safety Data Sheet – Deltamethrin.

Material Safety Data Sheet - LC Laboratories Cat. No. D-6153 - page 1

Revision Date: June 6, 2008

1. IDENTIFICATION OF SUBSTANCE:

Trade name: Deltamethrin

Product Number: D-6153

Manufacturer/Supplier:

LC Laboratories

165 New Boston Street

Woburn, MA 01801 USA

+1-781-937-0777 Fax: +1-781-938-5420

2. COMPOSITION/DATA ON COMPONENTS:Chemical Name: (S)- α -Cyano-3-phenoxybenzyl (1R)-cis-3-(2,2-dibromo-vinyl)-2,2-dimethylcyclopropanecarboxylate

Synonyms:

Hazardous Ingredient: Deltamethrin

CAS Registry Number: 52918-63-5

Molecular Weight: 505.20

Molecular Formula: $C_{22}H_{19}Br_2NO_3$ **3. HAZARDS IDENTIFICATION:**

Hazard Description: Highly Toxic (USA) Toxic (EU)

Dangerous for the environment

Harmful in contact with skin; readily absorbed through skin system

Toxic by inhalation

Very toxic if swallowed

May cause sensitization by inhalation and skin contact

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Target organ(s): central nervous system, cardiovascular system

Information pertaining to particular dangers for man and environment:

HMIS Ratings: Health =1 Flammability =0 Reactivity =0

4. FIRST AID MEASURES:

After Inhalation: If inhaled, remove to fresh air; if breathing is difficult, give oxygen; if breathing stops, give artificial respiration

After skin contact: flush with copious amounts of water; remove contaminated clothing and shoes; call a physician

After eye contact: flush with copious amounts of water; assure adequate flushing by separating the eyelids with fingers; call a physician

After swallowing: if swallowed, wash out mouth with copious amounts of water; call a physician

5. FIRE FIGHTING MEASURES:

Suitable extinguishing agents: water spray, carbon dioxide, dry chemical powder or foam

Protective equipment: wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Unusual fire hazard: may emit toxic fumes under fire conditions

6. ACCIDENTAL RELEASE MEASURES:

Person-related safety precautions: cordon off area of spill; wear self-contained breathing apparatus, protective clothing and heavy rubber gloves

Measures for cleaning/collecting: absorb solutions with finely-powdered liquid-binding material (diatomite, universal binders); decontaminate surfaces and equipment by scrubbing with alcohol; dispose of contaminated material according to Section 13

7. HANDLING AND STORAGE:

Information for safe handling: avoid contact with skin, eyes and clothing; material may be an irritant

Storage: store solid and solutions at -20 °C

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

Personal protective equipment as follows:

Breathing equipment: NIOSH/MSHA-approved respirator

Protection of hands: chemical-resistant rubber gloves

Eye protection: chemical safety goggles

Material Safety Data Sheet - LC Laboratories Cat. No. D-6153 - page 2

Revision Date: June 6, 2008

9. PHYSICAL AND CHEMICAL PROPERTIES:

Form:

Color:

Odor: none

Melting point/Melting range:

Danger of explosion: none

Solubility in / Miscibility with water: not soluble

Solvent content: none

Organic solvents: soluble in DMSO, ethanol, or acetone

10. STABILITY AND REACTIVITY:

Stability: avoid acids and bases

Thermal decomposition / conditions to be avoided: protect from light and heat

Dangerous products of decomposition: thermal decomposition may produce toxic gases such as carbon monoxide and carbon dioxide

11. TOXICOLOGICAL INFORMATION:

RTECS #: GZ1233000

Acute toxicity: none known

Primary irritant effect:

On the skin: none known

On the eye: not known; may be an irritant

12. ECOLOGICAL INFORMATION:

General notes: no data available

13. DISPOSAL CONSIDERATION:

Dispose of in accordance with prevailing country, federal, state and local regulations

14. TRANSPORT INFORMATION:

DOT:

Proper shipping name: none

Non-Hazardous for transport: this substance is considered to be non-hazardous for transport

IATA class:

Proper shipping name: none

Non-Hazardous for transport: this substance is considered to be non-hazardous for transport

15. REGULATIONS:

Code letter and hazard designation of product:

Hazard-determining components of labeling:

EU Risk And Safety phrases:

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S28: After contact with skin, wash immediately with plenty of water

S29: Do not empty into drains

S36/37/39: Wear suitable protective clothing, gloves, and eye/face protection

S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

S53: Avoid exposure - obtain special instructions before use

R21: Harmful in contact with skin

R23: Toxic by inhalation

R27/28: Very toxic in contact with skin and if swallowed

16. OTHER INFORMATION:

The above information is believed to be correct based on our present knowledge but does not purport to be complete. For research use only by trained personnel. The burden of safe use of this material rests entirely with the user. LC Laboratories disclaims all liability for any damage resulting from use of this material.

IX. Prairie Dog Mortality/Flea Collection Data Sheet

Prairie Dog Mortality/Flea Collection Data Sheet

Carcass/Burrow Number: _____

Species (circle one):

Black-tailed Prairie Dog

White-tailed Prairie Dog

Utah Prairie Dog

Gunnison Prairie Dog

Mexican Prairie Dog

Collection Date: _____

Collector Name: _____

Estimated Date of Death: _____

Collector Affiliation/Agency: _____

Collector Telephone Number: _____

Date of Flea Picking: _____

Collector Address: _____

General Location

Description: _____

UTM: _____ N _____ E

Township _____ Range _____ Section _____

County: _____ State: _____

Circumstances of

Collection: _____

X. Three Sample Signs for Posting in Areas of Plague Detection

CAUTION

SYLVATIC PLAGUE HAS BEEN FOUND IN MONUMENT PRAIRIE DOG POPULATIONS
PLEASE EXERCISE THE FOLLOWING PRECAUTIONS DURING YOUR VISIT:

Stay out of all areas that have been CLOSED by order of the Superintendent.
DO NOT go near or poke into any rodent holes or prairie dog burrows.
DO NOT handle any wild animals. Avoid dead or sick animals.
Pets are NOT allowed on the trails or in the backcountry, especially cats.
If you observe dead animals, contact a ranger or notify the visitor center as soon as possible.

What is Sylvatic Plague?

Plague is an acute infectious disease which primarily affects rodents, including prairie dogs. Plague can be passed to humans by wild rodents and by their fleas. The incubation period is usually 2-5 days but can be as short as 1 day or as long as 12 days.

What are the symptoms?

Feeling sick all over.
Sudden onset of fever.
Headache, nausea, vomiting, diarrhea.
Painful and swollen glands in the groin, armpits, and neck.

Plague is curable when treated in time.

Prompt diagnosis and treatment with antibiotics can stop the disease.

For more information, contact the Monument:
National Park Service
Devils Tower National Monument

CAMPGROUND/FACILITIES NOTICE

Prairie Dogs, chipmunks, ground squirrels and other wild rodents in this area may be infected with plague. Plague can be transmitted by an animal bite or fleas.

Avoid all contact with prairie dogs, chipmunks, ground squirrels and other wild rodents.

Do not feed or play with wild animals.

Avoid fleas by protecting pets with flea collars and keeping pets on a leash and out of prairie dog colonies.

See a physician if you become ill within one week of your visit to this area. Plague is a treatable disease.

Do not touch sick or dead animals

For further information contact:
National Park Service
Devils Tower National Monument

WARNING
AREA CLOSED
(Name of Area)

Sylvatic plague has been found in prairie dog populations in the (name of area) area.
Please exercise the following precautions during your visit to the Monument:

Stay out of areas that have been CLOSED by order of the superintendent
DO NOT go near or poke anything into rodent holes or prairie dog burrows
DO NOT handle any wild animals, living or dead

What is Sylvatic Plague?

Plague is an acute infectious disease which primarily affects rodents, including prairie dogs. Plague can be passed to humans by wild rodents and their fleas. The incubation period for the disease in humans is usually 2-5 days, but can range from 1 day to as long as 12 days.

What are the symptoms?

General flu-like symptoms, including headache, fever, and swollen glands in the groin, armpits, or neck.

PLAGUE IS CURABLE WHEN TREATED IN TIME!

If you develop these symptoms within 7 days of possible exposure, notify your doctor.

(Map of closed area)

The area marked above is CLOSED until further notice.

IF YOU HAVE QUESTIONS, CONTACT A PARK RANGER OR CALL THE MONUMENT
AT: (307) 467-5283.

XI. Sample Press Release

Draft Press Release for Plague Occurrence at Devils Tower National Monument

Date:

National Park Service
U.S. Department of the Interior

Devils Tower
National
Monument

PO Box 10
Devils Tower, WY
82714

307 467-5283 phone
307 467-5350 fax

DEVILS TOWER NATIONAL MONUMENT News Release

Date

FOR IMMEDIATE RELEASE

2013-0X

Devils Tower Facilities Temporarily Closed to Prevent Plague Transmission

To prevent transmission the sylvatic (bubonic) plague from black-tailed prairie dogs (*Cynomys ludovicianus*) to the visiting public, the National Park Service (NPS) would temporarily close pullouts near the prairie dog colony, the campground loop A, the amphitheater and the South Side and Valley View Trails beginning XXXXXXXXXX. When outbreaks of the plague are suspected, such closures are necessary and established under the Monument's Prairie Dog Management Plan Standard Operating Procedure for Plague Outbreak.

The closure is implemented to protect the visiting public from possible exposure to plague bacterium (*Yersinia pestis*) that is occasionally present in fleas on black-tailed prairie dogs. Transmission of the plague bacterium from prairie dogs to humans is rare and unlikely to occur except in the event of direct prairie dog-human interaction.

The remainder of facilities at Devils Tower would remain open. Visitors can get more information about plague, prairie dogs and closures at entrance station, visitor center, or administration building.

NPS staff would continue to survey the population to determine presence or absence of plague bacterium in the prairie dog colony and would be treating the colony to kill fleas. Areas would be reopened following treatment of all prairie dog burrows and a lack of detection of additional plague carrying fleas.

For further information on the plague closures and outbreaks, please contact the Monument's chief of resource management at (307) 467-5283 ext 212.

-END-

Appendix D: Protocols for Establishing Physical Barriers

Protocols for Establishing Physical Barriers from City of Fort Collins and City of Boulder

The following information is from the City of Boulder Open Space Operations Center (66 South Cherryvale Rd., Boulder, CO 80303, phone: (303)441-4142). Prairie Dog Visual Barrier Setup Guidelines.

Visual barriers help control the spread of prairie dog colonies by providing a physical boundary that prairie dogs are hesitant to cross. Although they are not a complete solution to the problem of confining prairie dogs to specific areas, they are an important component of an effective IPM program. In concern with other techniques visual barriers can provide a humane and passive means of controlling prairie dogs. In order to be effective the following guidelines should be kept in mind:

Prairie dogs seem to respond to holes where light can pass through the visual barrier by clawing and chewing at the fabric. Therefore, no light passage can be allowed along the bottom edge, along the seams or as a result of holes in the fabric. Proper installation and subsequent maintenance should prevent this. Holes in the fabric may be patched with duct tape and seams may be re-worked or sealed with tape. The lower six inches of fabric should be buried to form a "light-tight" seal.

Visual barriers are not effective when family units are split by the barrier. When burrows can be found on both sides of the barrier, the prairie dogs will continue to use the underground system of tunnels and burrows regardless of the fabric barrier.

Construction

The construction of visual barriers is not formal or standard. The methods would change as we gain experience. For the time being the following progression seems to make the most sense:

Excavate a narrow (width of a Pulaski blade) shallow (approximately six inches) trench in the soil directly under the strands of the existing fence. This can be done with a pick or pick-mattock in most areas. Be careful not to hit the fence wire while using the tools to prevent unpredictable recoil of the tool from fence wires. Put the excavated material on the side of the fence where you have access to it once the barrier is in place as you will need to bury the fabric. In cases where the fence has not yet been constructed, a trencher can be used to excavate the furrow.

Unroll a length of visual barrier material along the fenceline. You may need to cut the material if there is no available wooden post at the end of the roll, or if you are unable to stretch the material to an adjacent wooden post. Next, unroll a strand of high tensile fence (HTF) wire which will be used as the anchor wire along the bottom of the barrier. Smooth braided wire can also be used, but does not work as well. The wire should be at least six to ten feet longer than the piece of visual barrier material. The extra wire is necessary for attaching both ends to wooden posts.

Attach the smooth wire to the beginning and ending wooden posts. Then stretch the width with a fence stretcher tool until it is fairly taut and secure the wire to the posts as close as possible to the bottom of the trench.

Measure the height of the visual barrier when it is attached to the smooth wire in the trench. If no existing strand is available at the top or within one inch of the top of the fabric, it will be necessary to place a strand of HTF wire at the right height. Secure the HTF to two end posts but do not staple the wire to the correct height on the wooden support posts until step 7. Seldom is a wire at “just the right height”. In most cases it is preferable to install a “new” wire at the appropriate height.

Secure long rubber pieces over the staples on wooden posts to prevent abrasion of the fabric against fence clips, protrusions on the t-post, or barbs on the fence wires. This step is not always necessary if the barrier is attached to the side of the posts opposite the other fences wires.

Make an accordion pleat at the end of the visual barrier fabric, overlapping 8-10 inches four to six times. The end of the material should be folded on top of the leading edge. This thickened section would be secured to a wooden post with staples. Making sure the bottom edge of the fabric is flush with the ground, hammer the staples first through the top grommet and into the fence post. Then secure the bottom grommet. Several staples may be hammered between the top and bottom to secure this anchor point. Note: the staples should be oriented vertically (i.e. one time above not next to the other).

From this point the fabric would be attached to each of the wooden posts in succession. Someone can begin attaching the grommets along the fabric hems to the appropriate wires with plastic cable ties or hog rings. (If a new HTF strand was used, you may now raise the wire to the appropriate height and stable it to the wooden post with the fabric already attached.) Two people may then tighten the fabric until slack is removed and stable the fabric to fence posts. Use duct tape to reinforce the fabric in places where it cannot be stapled to the grommet. In some cases the crew may feel that it is necessary to better secure the barrier to the fence post. Place a strip or square of rubber over the fabric for protection and staple through the rubber into the post.

At the end of the length of fabric, fold the fabric over and secure it as described in step 6. In places where the bottom wire does not sit on the bottom of the trench, use rebar stakes to sink the wire into the trench bottom. The wire may be stapled to the base of the wooden posts to further secure it.

Fill the trench with the excavated material so that no light shows through the fence. If necessary, fill any prairie dog holes along the fenceline with soil and rocks. It may be necessary to take fill from the field to close gaps where light penetrates under the barrier. Each of the wood droppers on HTF fence is secured with metal clips. The end of these clips can tear the fabric. As a last step, bend the ends of the clips away from the fabric so they do not poke holes in the material.

Tool List

Fence stretchers
Fence pliers
Linesman pliers
Framing and sledge hammer(s)
Pulaskis

Equipment List

Visual barrier material
Cable ties
Smooth braided wire
Rebar stakes
Rubber strips and patches

Pick, Pick-Mattock

Shovels

McLeods (for raking dirt)

File to sharpen tools

Knives (for cutting fabric)

Tape measure

Apron with pockets

Duct tape (tan if possible)

Gloves

Safety Equipment

Fencing staples

HTF Equipment

Ratchets

Ratchet tool

Crimper

Nicopress sleeves

Spinning jenny and wire

The following information is from the City of Fort Collins, Natural Resources Department, Community Planning and Environmental Services (281 N. College Ave, P.O. Box 580, Fort Collins, CO, 80552-0580, Phone: (970)221-6600). Prairie Dog Visual Barrier Setup Guidelines.

PRAIRIE DOG VISUAL BARRIER SETUP GUIDELINES

Visual barriers help control the spread of prairie dog colonies by providing a visual blockage that prairie dogs are hesitant to approach. Although they are not a complete solution to the problem of confining prairie dogs to specific areas, they are an important component of an effective integrated prairie dog management program. In concern with other techniques visual barriers can provide a humane and passive means of controlling the prairie dogs movements. In order to be effective the following guidelines should be kept in mind:

Prairie dogs seem to respond to holes where light can pass through the visual. Therefore, when installing artificial barriers no light passage can be allowed along the bottom edge, the seams or as a result of damage to the barrier. Proper installation and subsequent maintenance should prevent this.

Visual barriers are not effective when the barrier separates family units or “coteries.” When connected burrows can be found on both sides of the barrier, the prairie dogs will continue to use the underground system of tunnels and burrows and move through the aboveground barrier.

The installation of visual barriers is not formal or standard. The methods would change as we gain experience. Current techniques range from the installation of vertical vinyl barriers, 36 inches high, attached to existing fences or erected separately, to the use of vegetation, topography, and horizontal barriers.

Installation of vertical barriers

City of Fort Collins, Natural Areas Program:

Artificial barriers are usually installed near property lines, with the intent of establishing a modest “prairie dog-free buffer zone.” Select the best location possible by staying near the property line, considering existing topography and the type of native vegetation that would be used to create an aesthetically appealing permanent barrier.

Prairie dogs must be removed from the buffer zone, making certain that coteries do not overlap the barrier.

An olive-colored vinyl barrier, 36 inches tall with a grommet every 3 feet on both the top and bottom is erected. A 3 inch trench can be formed to place the bottom of the vinyl into but is not necessary in all situations, remember that light cannot show through under the barrier when work is completed.

If a trench is used, caution should be given to not trample the excavated soil because it would be reused to backfill the bottom of the barrier.

If a trench is not used backfill material needs to be onsite and used to place along the soil surface and the bottom of the barrier, like a bead of caulking.

The support structure for the artificial barrier needs to be constructed using 5 feet wooden posts, t-posts, smooth wire.

The wooden posts should be placed at both the beginning and end of the structure and every 100 feet between.

Wooden posts should be installed to form a 3 feet wide H-post configuration.

This configuration is further strengthened using smooth wire that is tightened from the top corner of each post to the bottom of the other forming an X.

T-posts are then placed every 10 feet from the 1st H-post to the last H-post, facing the knobs away from the side that the barrier would be attached to.

Smooth wire can then be stretched from one end of the support structure to the other at the height of the barrier to be installed.

The wire is wrapped around the end wooden post and stapled, using fencing staples.

The wire is then attached to the t-post using fencing ties.

The vinyl barrier can now be attached to the support structure on the wind ward side.

The top is attached to the wire using hog rings or plastic tie-wraps at each grommet.

The bottom is secured using heaving landscaping pins at each grommet to anchor it to the ground before backfilling.

Options:

Artificial horizontal barriers can be installed in conjunction with the vertical vinyl barrier to discourage animals from tunneling directly under structure using 1 inch mesh and 35 inches wide poultry wire.

The wire should be buried 3 inches below the soil surface and extend out from the vinyl 2 ½ feet overlapping the bottom of the vertical barrier 6 inches on the prairie dog side of the barrier.

Native vegetation can then be planted in the area between the artificial barrier and the property line to establish a permanent barrier.

Bare-root native shrubs selected for the site are planted 1 foot apart in rows that are 2 feet apart, offsetting every other row of plants to create an 8 foot wide barrier.

Plastic weed barrier material, (4mil), is place on the ground before the shrubs are planted and removed after the first 3 to 5 years.

Mulch is placed over the weed barrier.

Shrubs are watered weekly, during the growing season, or as needed for the first 2 to 3 years.

Shrubs are weeded once during the growing season and pruned early in the dormant season for the first 2 to 3 years. Pruning encourages bushier growth

Other native vegetation is currently being experimented with.

Vines work well along fences.

Common cattails and coyote willow work well along ditch banks.

A mix of native tall grasses and wildflowers can also be established between the artificial and living barriers.

Grasses should be mowed twice during the growing season until established.

Wildflowers should not be added until after the grasses are established.

Appendix E: Prairie Dog Trapping, Handling, and Transporting Protocol

Prairie Dog Trapping, Handling, and Transporting Protocol

Adapted for Devils Tower National Monument (DETO) from:
Hubbell Trading Post National Historic Site (HUTR)
Prairie dog trapping/handling/transporting protocol
KEVIN CASTLE, NPS Wildlife Veterinarian

Short instructions; details below.

Develop JHA for this activity.

Buy/borrow traps.

Identify active burrows.

Prebait closed traps in position (2-3 days) at burrow entrances.

Set open, baited traps.

Transport animals to new location and release at appropriate site.

Repeat trapping at burrow(s) until all animals are captured or are trap-shy.

Move traps to another active burrow.

Details:

Equipment

-Tomahawk or other wire traps (14 x 14 x 40 cm or 15 x 15 x 50 cm). Number depends on # of burrows/systems, but should try to have 3-4 per burrow/system. Buy, or borrow from IPM, region, or state.

-Rolled oats or horse sweet feed mixture for bait. Peanut butter makes a big mess, so I do not recommend it for this project

-Leather gloves, dedicated clothing (only worn for trapping) or coveralls

-Insect repellent

Procedures

Prebaiting period (2-3 days)

Allows time for the animals to become accustomed to the unfamiliar objects, and allows the traps to “weather” and acquire odors associated with the area.

-Place closed traps in position near burrow entrances.

-Spread bait around and inside traps, and drop a small amount into burrow entrances.

Replace/refresh bait each morning and evening as needed.

Trapping

Prairie dogs and most other ground squirrels are active during the day. Plan to open traps well before sunrise, so you don’t disturb “early risers”. In some instances, traps can be opened at night, when prairie dog activity has stopped, but there is a good chance a nocturnal species may be caught or may trip the trap, and you may be faced with releasing a skunk or other critter that would be a challenge to take out. By mid-June, young of the year should be weaned; if they are seen on the surface they are likely able to feed themselves.

Clean as much leftover bait as possible from around the traps. Wear leather or latex gloves when handling bait that may have been partially chewed or defecated upon. Open the trap door and carefully place a small pile of bait in the trap, beyond the treadle, away from the open door. Alternatively, place the bait and then open the door.

Traps should be checked from a distance, if possible, every hour, or more frequently in hot or cold, wet weather. Trap covers can be employed, but will decrease trap success, and make it more difficult to see if anything is in the trap. Once you approach the traps, your chance of catching animals decreases greatly, so try not to disturb them unless necessary.

If the prairie dogs become trap-shy, you may need to remove traps for a few days, prebait, then trap again. We can be in touch and give recommendations.

Proper trap positioning

Look for tracks in the dirt, fresh feces, and open holes that are indicative of active burrows. Place traps as level as possible, within 1-2 m of the opening, with the open door facing a burrow. Don't actually block the burrow opening! Prairie dogs are less likely to climb *up* into a trap, so if you can't get them level, then a downward slope is better than an upward slope. If there is a high mound around the burrow, place the trap at a low spot. Try to "bury" the wire on the cage bottom, by moving the trap back and forth on the ground while setting it in place. Make sure you don't get too much dirt under the treadle, or it will not trip, even if an elephant enters the trap.

Health and Safety Measures

Because plague may be present near DETO, additional precautions should be taken when setting traps and handling/moving prairie dogs.

- Wear long pants, long-sleeve shirt, and gloves; apply DEET-containing product to clothing
- Be aware of sick prairie dogs and of fleas. Contact Wildlife Health (K. Castle, 970-219-0104) if you see sick/dead prairie dogs at any time
- Minimize handling; ideally you never have to touch animals, but can transport them in the trap.
- Transport animals in the bed of a pickup if possible or otherwise arrange to carry them outside a vehicle
- Wash hands with soap and water or an alcohol-based sanitizer if water is not available.
- Do not eat, drink, or smoke when handling animals.

Appendix F: Passive Relocation/Reverse Dispersal Translocation (RDT)

Passive Relocation/Reverse Dispersal Translocation (RDT)

Reprinted for reference, with permission.

Reverse Dispersal Translocation™ (RDT)

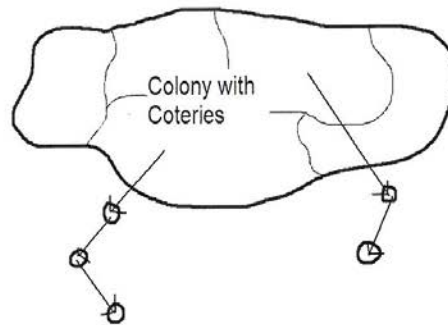
A passive prairie dog relocation method developed by Pam Wanek

- A passive relocation technique where prairie dogs are moved without physically handling them.
- Should only be used on sites where an adjacent colony can receive back prairie dogs.
- A barrier must be erected/fortified after all the animals are removed.
- All previously occupied burrows must be closed to inhibit prairie dogs from reoccupancy.
- Is considered as a non-lethal management option.
- Ideally, RDT is **best used from mid August through mid November (except in cases of single dispersers)**. This general guideline is based upon the activities of Black-Tailed Prairie Dogs (BTPD's) located in Colorado. The procedure is the most successful when BTPD's are active.
- Single dispersers are those prairie dogs that seem to pop up out nowhere. Do not wait for the August through November guideline. These particular prairie dogs need to be moved immediately (taking into the account inclement weather i.e. winter months).
- In cases where a spring construction project is anticipated, RDT should be performed from August through mid November and then monitored throughout the season up to and during the construction project.
- Two types of RDT: The Roll and Part The Sea
 - The Roll- is used when prairie dogs need to be permanently excluded from an area. In this case prairie dogs are gradually "rolled" out of the objectionable area and then acclimated into the acceptable area.
 - Part The Sea – is used when prairie dogs need to be temporarily moved out of the way for a project such as construction, utility line installations, or a variety of other projects. Once the project is completed, prairie dogs are allowed to reoccupy the removal area,
- RDT is a prairie dog management tool, and as with most wildlife management projects, this process requires diligent monitoring at first and then consistent monitoring over time.
- The application has been used for the following: developed neighborhoods and parks, commercial office parks, parking lot medians, building expansion projects, utility line installations, various construction projects, solar panel project, athletic fields, trail expansions, removal from detention pond or floodplain dam embankments, various rural applications, barrier installations, revegetation projects and in conjunction with active relocations.
- **FAQs:**
 - Q: How long does the process take?
 - A: Each situation is unique, in most cases it can take anywhere from one week to one month.
 - Q: How does this work?
 - A: RDT is based upon the philosophy that prairie dogs, being both a prey species and social animal can be encouraged to move back to their place of origin when their current occupied territory is threatened. In practice, each burrow is manipulated by installing a one way wire flap door where prairie dogs can move out of the burrow but cannot gain re-entry.
 - Q: What about the impacts to non-target species?
 - A: Impacts to non-target species should always be considered for any altercation of prairie dog burrows whether it is by RDT, active relocation, or lethal control.

Q: What types of permits are required for RDT? A: Since RDT is a passive relocation technique meaning the animal is not handled, the Colorado Division of Wildlife does not require a permit at the time of this writing; however, local governments may require a permit.

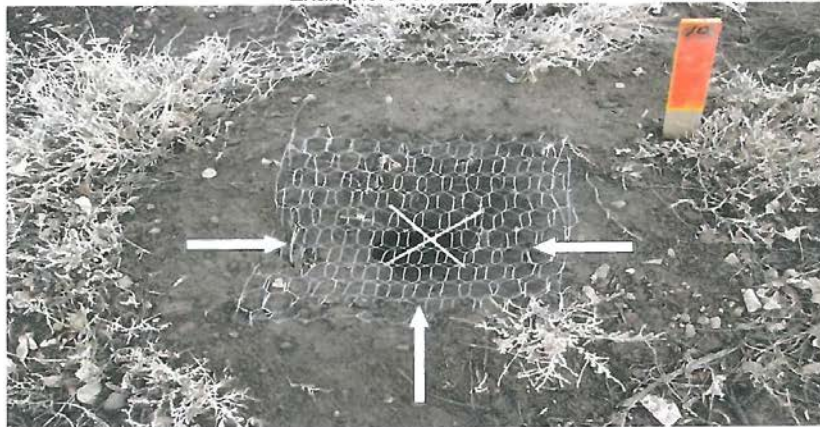
For additional information, please contact Pam Wanek at Wanek@Q.com or call 303-507-8580

RELATED PHOTOS:



Sample dispersal pattern where prairie dogs begin to expand territory. RDT methods reverse this pattern causing prairie dogs to move back into old territory to stabilize the colony.

Example of one way door



1/11/2012

**Reverse Dispersal Translocation™ (RDT),
a Passive Prairie Dog Relocation Technique**
Developed by Pam Wanek



- RDT is a passive relocation technique where prairie dogs are moved without physically handling the animal.
- RDT is only used in situations where you have an adjacent colony that can receive back prairie dogs
- A barrier must be erected after all the animals are removed
- All previously occupied burrows must be closed to inhibit prairie dog from reoccupying the removal area



The key component with RDT is working with the prairie dog by understanding "their world."
RDT is best used during a time when prairie dogs colonies have "settled." Meaning, it is used well after breeding and maturation of newborn prairie dogs and when territorial disputes among coterie members are reduced.

- RDT is best used from mid August through early November. This general guideline is based upon the activities of BTPD's.
- RDT is a prairie dog management tool, and as with most wildlife management projects, this process requires diligent monitoring at first and then consistent monitoring over time.

How does this work?

- By systematically closing down burrows we can cause prairie dogs to leave occupied areas.
- Burrow closure is performed on a gradual basis which allows prairie dogs the opportunity to acclimate back into the colony.
- Prior to closing burrows it must be determined that the prairie dog no longer occupies that burrow.



Getting Started





TEMP	18-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
TEMP	45	50	70	75	75	45	75	75	45	70
TIME	10:30 A.M.	10 A.M.	10 A.M.	12 P.M.	3 P.M.	9 A.M.	5 P.M.	3 P.M.	9 A.M.	11:30 A.M.
Subject										
1	WS	WAS	WAS	WVS	WVS	C	C	C	C	
2	WS	WAS	WAS	WVS	WVS	C	C	C	C	
3	CAR 1	S	AS	WS	WAS	WVS	WVS	C	C	
4	CAR 2	S	AS	WS	WAS	WVS	WVS	WVS	WVS	C
5	S	AS	AS	WS	WAS	WVS	WVS	WVS	WVS	C
6	S	AS	AS	WS	WAS	WVS	WVS	WVS	WVS	C
7	S	WS	WAS	WAS	WAS	VS	WAS	VS	WVS	
8	S	WS	WAS	WAS	WVS	WVS	C	C	C	
9	S	AS	WS	WAS	WVS	WVS	C	C	C	

1/11/2012

Test wire to make sure when lifted at top that the wire flops back down creating a flap door.



Sticks have moved indicating prairie dog activity. This is called Wired Active Stick (WAS). Restick and monitor until burrow becomes inactive (WIS)



Progression of RDT projects

- It is very important to monitor the site daily and progressively move along working the burrows.
- Consistent work on the burrows creates a "move it" momentum that is felt by the prairie dog.
- If you do not stay with the project, over time prairie dogs can reopen closed burrows.

SITE NAME: JOHNSON PROJECT 2008

Prepared by Prairie Preserves LLC 2008

Date	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
TEMP	45	50	50	70	75	45	70	75	40	50
TIME	10:30 A.M.	10 A.M.	10 A.M.	12 P.M.	3 P.M.	8 A.M.	5 P.M.	3 P.M.	9 A.M.	11 A.M.
Stake#										
1	WS	WAS	WAS	WS	WS	WS	C	C	C	C
2	WS	WAS	WAS	WS	WS	WS	C	C	C	C
3	DAIR 1	S	AS	WS	WAS	WS	WS	WS	C	C
4	DAIR 2	S	AS	WS	WS	WAS	WS	WS	WS	C
5	S	AS	AS	WS	WAS	WAS	WS	WS	WS	C
6	S	AS	AS	WS	WAS	WS	WS	WS	WS	C
7	S	WS	WAS	WAS	WAS	WS	WS	WS	WS	C
8	S	WS	WAS	WAS	WS	WS	WS	WS	C	C
9	S	AS	WS	WAS	WS	WS	WS	C	C	C

Legend: W=Wire, S=Staked, A=Active, I=Inactive, C=Closed, DAIR = Open Active Recalling Burrow

NOTE #7 WHERE THE WIRE IS NOT WORKING ON BURROW THEN SWITCH TO A DRYER VENT

When all else fails use the dryer vent



4" Diameter single flap dryer vent



1/11/2012

Top vent view "Ace Dryer Vent"



Fit dryer vent with corrugated irrigation tube (cut one inch shorter than the dryer vent sleeve!)



Slip tube into sleeve of vent



Proper fit of device



To secure tube and sleeve apply duct tape all around vent bottom



Fortify vent hood to sleeve.



1/11/2012

Checking depth and structure of tunnel.



Ensure a snug fit around vent sleeve and tunnel wall so prairie dogs cannot dig around vent sleeve



Sometimes an extension piece is needed to get a snug fit between vent sleeve and tunnel walls.



After vent is installed backfill tunnel around vent sleeve.



Position a 2' by 2.5' piece of poultry wire over vent



Secure wire with 6 inch pins



1/11/2012

Cut slit in wire along vent hood opening



Push cut portion of wire to floor of tunnel entrance



Secure bottom slit floor with 6" pins



Cover poultry wire with soil



Dryer vent ready for use



Prop open door on vent (VS) when stick moves this means the prairie dog has gone through vent and is recorded as (VAS)



1/11/2012

As the prairie dog moves out the vent, the flap will close. After this time, place sticks over vent flap and monitor activity (VIS)



After 72 hours of inactivity, close the burrow. Dig far enough back for a 6 inch distance between soil line and top of tunnel



Using bat and hammer backfill soil into tunnel to a depth of 8 inches below soil line.



Mold wire piece over bat



Pack wire into tunnel and form wire against tunnel sides



Insert 11 Inch edge pin through middle of wire



1/11/2012

Secure pin with bat and hammer



Secure softball sized rock into wire or backfill soil inside wire basket



Use 6" pins to secure wire around tunnel walls



Using 6" pins, apply second top wire over closed burrow. Remove this wire after project completion. This burrow is recorded as closed or (C)



PROJECTS



RDT USES

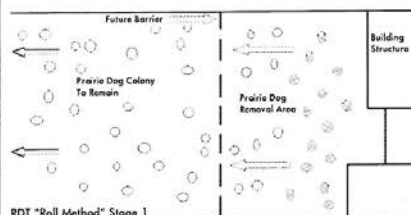
- The application has been used for prairie dogs:
- residing in areas slated for construction, moving them out of landscaped areas, tree wells, medians, groomed parks, athletic fields, detention pond banks, highway embankments, sidewalk expansions, utility line installations, solar panel installations and where member coterles are split between the line of prairie dog barrier installations.

1/11/2012

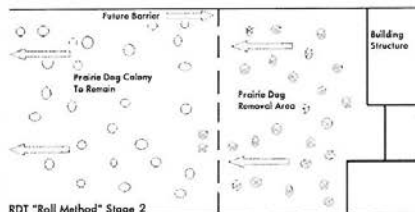
Two RDT methods

- The Roll – the Roll is used for areas that require complete prairie dog exclusion. When you roll prairie dogs you move them gradually out of the entire area by systematically closing down unoccupied burrows.
- Part the Sea – this method is used when prairie dogs need to be temporarily moved out of the way but are allowed to reoccupy the area once the particular activity is completed.

The Roll Stage I



The Roll Stage II



McKay Landing "After" RDT "Roll"
used to remove prairie dogs from
developed area



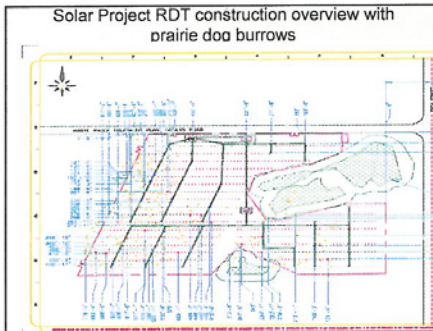
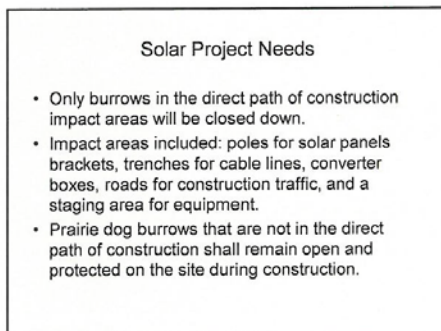
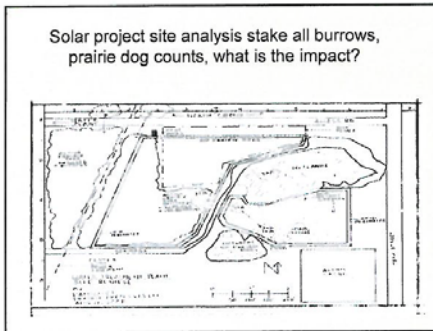
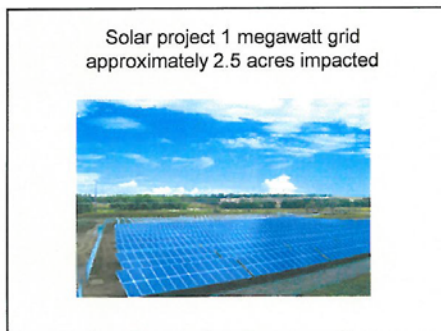
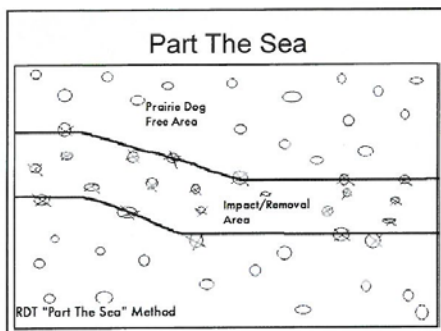
McKay Landing back side of barrier



McKay Landing colony view



1/11/2012



1/11/2012

Solar project prairie dogs peer out of active burrows while construction in progress



Solar project working side by side active prairie dog mounds



Solar project completed, colony saved!



Many thanks to:

- Lindsey Sterling-Krank Director Prairie Dog Coalition and HSUS
- All the people that have supported me along the way
- The following projects where RDT was performed:
- Ball Aerospace, Broomfield
- City of Boulder
- East Boulder Community Center
- Valmont Park South
- Tom Watson Park
- Foothills Community Park
- Ft. Hills/Arapahoe Rd widening, CDOT Revegetation and Wetland mitigation
- Xcel Pole Project
- Waste Water Treatment Plant
- Site Wise
- Fire Training Center
- Front Range Community College
- City of Longmont
- McKay Landing, Broomfield
- Legacy High School, Broomfield
- Total Long-term Care, Thornton
- Walsh Environmental BCH Wetlands Project
- Vexcel Energy

Appendix G: Zinc Phosphide

Adapted from the Zinc Phosphide Prairie Dog Bait label, South Dakota Department of Agriculture

Zinc phosphide is a restricted use pesticide. The following Zinc Phosphide Prairie Dog Bait label from South Dakota Department of Agriculture will serve as a guiding document for zinc phosphide use in the Monument unless a more current or applicable label is approved. All label instructions should be followed with the added mitigation of bait being placed inside the prairie dog burrow.

Zinc phosphide has a maximum shelf life of three years. Moisture and storage conditions can reduce its storage life to only a few months. To reduce the amount of pesticides stored and disposed of, purchase only the amount needed for use in one year and store properly.

Pesticide Storage: Store only in original container, in a cool, dry place inaccessible to children and pets. Keep containers closed and away from other chemicals. Zinc phosphide would be stored in a locked chemical cabinet separate from other chemicals and accessed only by Devils Tower National Monument Resource Management.

Pesticide Disposal: Pesticide wastes are toxic. If these wastes cannot be disposed of by use according to label instructions, Crook County Weed and Pest will accept pesticides for disposal. Contact: Crook County Weed & Pest Control District, 802 S. 11th Street, PO Box 7, Sundance, WY 82729, 307-283-2375, ccwp@rangeweb.net

Do not contaminate water, food or feed by storage or disposal.

Container Handling: Do not reuse or refill original container. Puncture container and offer for recycling, if available. If empty container is not to be recycled, puncture container, then dispose of it by placing in trash, delivering it to an approved waste disposal facility or by incineration.

Spilled and Excess Bait: Wearing waterproof gloves, clean up any spilled bait immediately and collect excess bait from application equipment. If bait cannot be applied according to label directions, properly dispose of it according to the section "Pesticide Disposal".

Carcasses: Wearing waterproof gloves, bury carcasses of prairie dogs (18 inches deep) in holes dug on site or in inactive burrows. Cover and pack with soil. Alternately, use other disposal methods that state and local authorities allow.

Note: Zinc phosphide may only be used to control black-tailed prairie dogs (*Cynomys ludovicianus*) during the period from July of one year to February of the next year. Only one application within this period is permitted. One additional application within this period is permitted only if the treated area has been re-infested by prairie dogs from neighboring lands. Do not exceed the application rate. Apply only to rangeland with less than 50% ground cover. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. Keep all other persons out of the treated area during application. Areas in the

monument treated with zinc phosphide must be closed to visitors until the area is cleared of all unused bait and carcasses are disposed of.

Pre-baiting (Mandatory): To condition the prairie dogs to accept the grain containing zinc phosphide readily, pre-bait each active burrow to be treated with a teaspoon amount (4 grams or 0.14 oz) of untreated oats prior to application of toxic bait. Do not apply zinc phosphide unless the prairie dogs have consumed the pre-bait.

Observations for Non-target Species

Before applying toxic bait, determine the potential for exposing non-target organisms. Applicators must conduct daily observations prior to applying toxic bait. Do not apply this product if non-target species are observed to be feeding on pre-bait. It is a violation of Federal Law to feed treated bait to non-target species, including protected species, intentionally.

Hand Application Only: Using a utility spoon or calibrated, hand-operated, mechanical bait dispenser, apply a teaspoon (4 grams or 0.14oz) of bait in each active prairie dog burrow.

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMAN AND
DOMESTIC ANIMALS**

CAUTION

Harmful if swallowed, absorbed through the skin, or inhaled. Causes moderate eye irritation. Avoid breathing dust. Any person who retrieves carcasses or unused bait following application of this product must wear waterproof gloves.

**PERSONAL PROTECTIVE
EQUIPMENT(PPE)**

All handlers, including loaders and applicators, must wear long sleeve shirt, long pants, shoes, socks, and waterproof gloves. Any person who retrieves carcasses or unused bait following application of this product must wear waterproof gloves.

User Safety Requirements:

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash hands thoroughly after applying bait and before eating, drinking, chewing gum, using tobacco or using the toilet, and change into clean clothing.

ENVIRONMENTAL HAZARDS

This product is extremely toxic to birds, fish and other wildlife. Wildlife feeding on treated bait may be killed. Dogs, cats, and other predatory and scavenging mammals and birds might be poisoned if they feed upon animals that have eaten this bait. Do not contaminate water when disposing of equipment wash water or rinsate. Do not apply directly to water.

**ENDANGERED SPECIES
CONSIDERATION**

Notice: The use of this product may pose a hazard to Federally designated endangered/threatened species. It is a Federal offense to use any pesticide in a manner that results in the death of a member of an endangered species. Consult the nearest U.S. Fish and Wildlife Service regional office or the appropriate State Agency for current information on habitats occupied by endangered species.

Whooping Crane Do not use this product in habitats occupied or occasionally visited by whooping cranes (*Grus Americana*) during the period from 30 days before the expected arrival of cranes to 30 days after the time of their usual departure.

Black-footed Ferret Do not use this product within 7 kilometers (4.34 miles) of any prairie dog town to limit risks to the black-footed ferret (*Mustela nigripes*) from exposure to Zinc Phosphide or destruction of its prey base, unless the colony is an isolated black-tailed prairie dog town less than 80 acres in size or an isolated white-tailed prairie dog town less than 200 acres in size, or unless the town had been appropriately surveyed, using methods acceptable to the U.S. Fish and Wildlife Service, and found by the FWS not to be suitable site for ferret reintroductions.

Gray Wolf and Grizzly Bear Unless the local U.S. Fish and Wildlife Service office has determined that there are no gray wolves (*Canis lupus*) or grizzly bears (*Ursus arctos horribilis*) in the general vicinity of bait applications in Montana and Wyoming, do not apply this product outdoors within occupied habitat of these species.

**RESTRICTED USE
PESTICIDE**

Due to Hazards to Non-target Species
For retail sale to and used only by Certified
Applicators and only for those uses covered by
the Certified Applicator's certification.

**ZINC PHOSPHIDE
PRAIRIE DOG BAIT**

For use in rangeland and pastureland to
control black-tailed and white-tailed prairie
dogs in North Dakota, South Dakota,
Nebraska, Montana, Wyoming, and Kansas.

Active Ingredient
Zinc Phosphide..... 2.0%
Inert Ingredients.....98.0%
Total.....100.00%

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

FIRST AID

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-858-7378 for emergency medical treatment information.

If you experience signs and symptoms such as nausea, abdominal pain, tightness in chest, or weakness, see a physician immediately. For information on pesticide products (including health concerns, medical emergencies, or pesticide incidents), call the National Pesticide Information Center at 1-800-858-7378.

IF SWALLOWED: Call a Poison Control Center, doctor, or 1-800-858-7378 immediately for treatment advice or transport the person to the nearest hospital. Do not give any liquid to the patient. Do not administer anything by mouth. Do not induce vomiting unless told to do so by the poison control center or doctor.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes.

Call a poison control center, doctor, or 1-800-858-7378 immediately for treatment advice.

IF INHALED: Move person to fresh air.

If person is not breathing call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.

Call a poison control center, doctor, or 1-800-858-7378 immediately for treatment advice

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes.

Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor immediately for treatment advice.

TREATMENT FOR PET POISONING

If animal eats bait, call veterinarian at once.

NOTE TO PHYSICIAN OR VETERINARIAN

Contains the phosphine-producing active, Zinc Phosphide. Probable mucosal damage may contraindicate the use of gastric lavage. For animals ingesting bait and/or showing poisoning signs, induce vomiting by using hydrogen peroxide. Sodium bicarbonate can be given orally to neutralize the stomach acidity. The stomach and intestinal tract can be evacuated, oxygen administered and cardiac and circulatory stimulants given. See Left Panel for additional precautionary statements.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store only in original container, in a cool, dry place inaccessible to children and pets. Keep containers closed and away from other chemicals.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. If empty container is not to be recycled, then dispose of it by placing in trash, delivering it to an approved waste disposal facility or by incineration.

SD Dept. of Agriculture Est. No. 13808-8D-1
Rodent Control Fund EPA Reg. No. 13808-6
Foss Building Net Weight 50 lbs.
Pierre, SD 57501

DIRECTIONS FOR USE

It is a violation of Federal Law to use
this product in a manner inconsistent
with its labeling.

READ THIS LABEL: Read entire label and follow all use directions, use precautions, and use restrictions. Use only for the sites, pests, and application methods described on this label.

USE RESTRICTIONS

This product may only be used to control black-tailed prairie dogs (*Cynomys ludovicianus*) and white-tailed prairie dogs (*C. leucurus*) on rangelands and pasturelands in the States of Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming only during the period from July of one year to February of the next year. Only one application within this period is permitted. One additional application within this period is permitted only if the treated area has been re-infested by prairie dogs from neighboring lands. Do not exceed the application rate. Apply only to rangeland with less than 50% ground cover. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. Keep all other persons out of the treated area during application

PREBAITING (Mandatory): To condition the prairie dogs to accept the grain used in this product readily, prebait each active mound to be treated with a teaspoon amount (4 grams or 0.14 oz) of untreated oats prior to application of toxic bait. Do not apply this product unless the prairie dogs have consumed the prebait.

OBSERVATIONS FOR NONTARGET SPECIES

Before applying toxic bait, determine the potential for exposing nontarget organisms. Applicators must conduct daily observations prior to applying toxic bait. Do not apply this product if nontarget species are observed to be feeding on prebait. It is a violation of Federal Law to feed treated bait to nontarget species, including protected species, intentionally.

BAIT APPLICATION

HAND BAIT APPLICATION ONLY: Using a utility spoon or calibrated, hand-operated, mechanical bait dispenser, apply a teaspoon (4 grams or 0.14oz) of bait per placement, over a six inch diameter circle on the edge of the mound within 3 feet of the opening of the active prairie dog burrow.

**DISPOSAL OF SPILLED AND EXCESS
BAIT, AND CARCASSES**

Spilled and Excess Bait: Wearing waterproof gloves, clean up any spilled bait immediately and collect excess bait from application equipment. If bait cannot be applied according to label directions, properly dispose of it according to the "Pesticide Disposal" text.

Carcasses: Wearing waterproof gloves, bury carcasses of prairie dogs (18 inches deep) in holes dug on site or in inactive burrows. Cover and pack with soil. Alternately, use other disposal methods that state and local authorities allow.

NOTICE

DISCLAIMER: To the extent consistent with applicable law, seller makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. To the extent consistent with applicable law, buyer assumes all risk of use and/or handling of this material when such use and/or handling is contrary to label instructions.

Appendix H: Literature Sources

Literature Sources

Literature may be found at the Monument library or resource files. Additional sources may include local universities (and their interlibrary loan process) and other local agencies. Local libraries may also be able to provide literature or be able to get literature through interlibrary loans. Information can also be readily found on the internet by using any number of search engines, such as www.google.com. A limited selection of literature is also on file at the Intermountain Regional Office in Denver (IMRO-Denver) either in electronic or hard copy files, which may be requested (see list below). Additional sources include:

- NPS Electronic Technical Information Center (www.etic.nps.gov)
- NPS Library Online Catalog – Voyager (www.library.nps.gov)
- Journal Storage (www.jstor.org) Contact Bonnie Semro at IMRO-Denver for log-in procedures (Ph. 303-969-2854).
- USGS Library website: (www.usgs.gov or <http://library.usgs.gov/>)
- USFS Prairie Dog Literature website:
(<http://www.fs.fed.us/rt/nebraska/gpng/literature/litpdog.html>)
- USGS Sage Map website: <http://sagemap.wr.usgs.gov>

Intermountain Regional Office Natural Resources

Prairie Dog Literature

Hard Copy on file at IMRO (copies available upon request)

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PDF or electronic files (included in prairie dog management plan template Literature and Information files)

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