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Final Environmental Impact Statement

Thunder Basin National Grassland Prairie Dog Management Strategy and Land and Resource Management Plan Amendment #3

Douglas Ranger District, Medicine Bow-Routt National Forests and Thunder Basin National Grassland

Campbell, Converse, Niobrara and Weston Counties, Wyoming

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Final Environmental Impact Statement

Campbell, Converse, Niobrara and Weston Counties, Wyoming

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Abstract: The Forest Service proposes to amend the Thunder Basin Land and Resource Management Plan (LRMP) as needed to support implementation of an updated strategy to manage black-tailed prairie dogs on Thunder Basin National Grassland (TBNG). This strategy relies on using the full spectrum of management tools needed to maintain viable populations of prairie dogs and to support reintroduction of the endangered black-footed ferret. This strategy will also maintain populations of other associated species within prairie dog colonies while reducing unwanted colonization of prairie dogs on adjoining lands along national grassland boundaries. The amendment may include changes to LRMP standards and guidelines and may modify the boundary of the Black-footed Ferret Reintroduction Habitat Management Area (MA 3.63). The modification of MA 3.63 boundary is proposed to provide a more biologically appropriate management area boundary for prairie dog colonies based upon topographical and biological barriers. The proposed MA 3.63 changes incorporate federal lands recently acquired through land exchange that provide additional suitable and historically occupied prairie dog habitat. Alternatives include Alternative 1-No Action, Alternative 2-Proposed Action, Alternative 3-Boundary Management, Alternative 4-Adjusted Management Area and Limited Rodenticide Use (Environmentally Preferred), and Alternative 5-Additional Category 2 Areas (Preferred).

EXECUTIVE SUMMARY

The Forest Service proposes the following actions to meet the purpose and need described below:

- Adopt and implement a Black-tailed Prairie Dog Conservation Assessment and Strategy for the Thunder Basin National Grassland which provides overall direction on managing for viable populations of prairie dogs and their habitat in support of the future reintroduction of black-footed ferrets and to provide habitat for ferrets and other associated species. It includes guidance for use of lethal or non-lethal management tools in site-specific situations, such as encouraging prairie dog expansion into unoccupied suitable habitat or reducing unwanted colonization of prairie dogs on adjoining private lands along TBNG boundaries.
- Amend the Thunder Basin National Grassland Land and Resource Management Plan (LRMP) standards and guidelines as needed to support the Black-tailed Prairie Dog Conservation Assessment and Strategy and to modify the boundary of the Black-footed Ferret Reintroduction Habitat (MA 3.63). The proposed boundary modification of the Black-footed Ferret Reintroduction Habitat is necessary to provide a more biologically appropriate boundary for prairie dog colonies based upon topographical and biological barriers. It includes federal lands recently acquired through land exchange that provide additional suitable and historically occupied prairie dog habitat.

Purpose and Need
To meet Grassland-wide Goals and Objectives (Goal 1.b, Objective 1), the desired conditions prescribed under the MA 3.63 direction, the instructions from the Department of Agriculture's LRMP discretionary review of the Chief's LRMP appeal decision, and to contribute to the goals established in the 1988 National Black-footed Ferret Recovery Plan, , the purpose of the proposed action is to establish and maintain the public support and the biological environment needed to facilitate the reintroduction of black-footed ferrets on the TBNG.

To achieve this purpose, the Forest Service has identified the need to:

- Proactively manage prairie dog populations on the TBNG in an environmentally, biologically, and socially acceptable manner that provides for the long-term conservation of black-tailed prairie dogs and other species associated with prairie dog colonies,
- Manage prairie dog populations, colonies and complexes on the TBNG in adequate acreages and distributions to provide habitat conditions that support future reintroductions of black-footed ferrets.
- Manage prairie dogs and their habitat to minimize unwanted colonization onto adjoining private and State lands to address local landowner concerns about possible losses of agricultural production, costs of controlling prairie dogs, effects on land values, and risks to human and animal health and safety that may occur if prairie dogs colonize adjacent non-federal lands.
- Gain local landowner and state of Wyoming support for a prairie dog management strategy on the TBNG that provides for the biological needs of the black-footed ferret and minimizes potential adverse impacts to adjacent non-federal landowners.

Based on the purpose and need to gain local landowner support for the management of prairie

dogs and black-footed ferrets, local landowners and other interested parties and the Forest Service had initial discussions on possible management of prairie dogs in the TBNG area. Based on these discussions, the group decided to develop a prairie dog management strategy

Black-tailed Prairie Dog Conservation Assessment and Management Strategy Summary (Appendix A)

From June 2005 through 2006, individuals from the Forest Service, Thunder Basin Grasslands Prairie Ecosystem Association (TBGPEA), Wyoming Game and Fish (WGFD), Bureau of Land Management, US Fish and Wildlife Service, and Environmental Defense worked to develop a collaborative prairie dog management strategy. This strategy was developed at a landscape scale to define how prairie dogs could be managed and conserved over multiple land ownerships. In addition to prairie dog habitats on public lands, private landowners have agreed to maintain prairie dog habitats on their private lands. Private land habitats will be documented through Candidate Conservation Agreements with Assurances (CCAA). Following is a summary of this strategy. The complete document can be found in Appendix A.

A. Category 1 Prairie Dog Habitat

- A single Category 1 Prairie Dog Habitat will be maintained within the planning landscape and will be included within the Black-footed Ferret Reintroduction Habitat (MA 3.63).
- The Category 1 Prairie Dog Habitat is designed to be an adequate size and spatial configuration to sustain a viable population of black-footed ferrets.
- The Category 1 Prairie Dog Habitat has a management objective of at least 18,000 acres of active prairie dog colonies. It is anticipated that 18,000 acres will be sufficient habitat to allow ferrets the opportunity to persist through a future plague epizootic and recover naturally along with the prairie dog populations. The acreage in Category 1 is not capped at 18,000 acres, but would be allowed to grow within the boundary of the MA 3.63. The 18,000 acre objective only serves as a potential trigger point if prairie dogs are expanding onto adjacent private lands.
- Each colony within a Category 1 Prairie Dog Habitat will be no more than 1.5 km from another colony within the Prairie Dog Habitat.
- The location of Category 1 Prairie Dog Habitat is based on the current and historical distribution of prairie dogs across the planning landscape as well as areas most suitable as prairie dog habitat as defined by slope, vegetation and soil characteristics.
- Secondly, Category 1 Prairie Dog Habitat was sited so as to utilize, to the maximum extent feasible, public lands such as TBNG.
- Natural barriers to prairie dog expansion such as large areas of unsuitable habitat were utilized to the maximum extent feasible to bound the Category 1 Prairie Dog Habitat.

Category 1 Prairie Dog Habitat - Control[A] and Management

- Within Category 1 (MA 3.63), prairie dogs will be allowed to disperse and colonize new areas naturally.
- Any prairie dog control efforts within MA 3.63 proposing to use rodenticides may only be initiated if cumulative acreage of active prairie dog colonies within Category 1 exceeds 18,000 acres. Use of rodenticide on federal lands may only be employed within ½ mile of the TBNG boundary, and only in cases where non-lethal options have been tried and exhausted. Translocations to suitable areas will be a preferred method of control.

[A] Control includes all management tools that limit or direct prairie dog expansion, not just rodenticide use.

- ☐ In areas where no natural barriers exist, a buffer of ungrazed or lightly grazed areas will be used to discourage colonization out of the designated Category 1 Prairie Dog Habitat (MA 3.63).
- ☐ If and when control becomes necessary along TBNG boundaries within the Category 1 area, selection of colonies to be controlled will be based on habitat values to black-footed ferrets as well as the ages of the colonies.
- ☐ Category 1 Prairie Dog Habitat will be considered core habitat area. Recreational shooting of prairie dogs would be prohibited year round within a Category 1 Prairie Dog Habitat (MA 3.63).
- ☐ If active prairie dog acreage falls below 10,000 acres within Category 1 Prairie Dog Habitat translocations will be considered.

B. Category 2 Prairie Dog Habitat

- ☐ Two Category 2 Prairie Dog Habitats will be maintained within the planning landscape. Both of these Category 2 habitats will be located almost entirely on private lands.
- ☐ Category 2 Habitats are necessary to provide an adequate distribution of prairie dogs and their associated species across the landscape and provide some level of protection against a landscape-wide plague epizootic.
- ☐ Category 2 Habitats will contribute to sustaining viable populations of prairie dogs and their associated species (with the exception of black-footed ferrets).
- ☐ Each Category 2 Prairie Dog Habitat has a management objective of a minimum of 1,500 acres of active prairie dog colonies within 7 km of each other. Combined, Category 2 Prairie Dog Habitats have a management objective of 7,000 acres of active prairie dog colonies.
- ☐ The purpose of the Category 2 Prairie Dog Habitat is to provide for viable populations of prairie dogs and their associated species as well as provide significant ecological diversity at the landscape scale.
- ☐ Category 2 Habitat may be composed of clusters of a few large colonies, or more numerous smaller colonies. The sizes of individual colonies within Category 2 Habitat will vary according to natural variation and to meet the needs of various associated wildlife species.
- ☐ Colony sizes and configurations which have been demonstrated to minimize the severity of a plague outbreak will be preferred and managed for.
- ☐ Locations for Category 2 Prairie Dog Habitats are based on habitat suitability as well as the current and historical distribution of prairie dogs (See 'Defining Habitat Suitability'), known presence of associated species, or are considered high value habitat for other reasons.
- ☐ At least one Category 2 was located as far as possible from the Category 1 Prairie Dog Habitat to reduce and/or slow the spread of a plague epizootic and provide some redundancy in the system.

Category 2 Prairie Dog Habitat - Control and Management

- ☐ Translocations will be considered if any individual Category 2 Prairie Dog Habitat falls below 500 acres *or* total Category 2 acreage falls below 1,500 acres.
- ☐ In the event that Category 2 acreage exceeds 7,000 acres, control of colonies within Category 2 areas could be considered. In such cases, newer colonies and colonies with lower habitat value for associated species would be prioritized for control efforts.

- ☐ Rodenticide use may occur on Category 2 Prairie Dog Habitats in a manner that is consistent with the specified goals of each Category 2 Prairie Dog Habitat and consistent with incentive agreements.
- ☐ Prairie dog control efforts may only be initiated if cumulative acreage of active prairie dog colonies on Category 2 lands exceeds 7,000 acres. Lethal control on federal lands may only be employed within ½ mile of TBNG boundary, in cases where non-lethal options have been tried and exhausted. Translocations to suitable areas will be a preferred method of control.
- ☐ Regulated shooting could be allowed on Category 2 Prairie Dog Habitats so long as it is not found to compromise the ecological objectives of these areas. Use of full-metal jacket bullets is recommended to reduce possible secondary lead poisoning.
- ☐ The locations and boundaries of Category 2 Prairie Dog Habitats may change and shift depending on prairie dog activity, new information, or other management objectives.

C. Category 3 Habitats

Category 3 Prairie Dog Habitats are small isolated colonies which do not fall within the boundaries of Category 1 or 2 Prairie Dog Habitats and occur south of Highway 450 and East of R67W. They also fall within the TBGPEA potential CCAA area.

- ☐ Two thousand acres of Category 3 Colonies strategically located across the planning landscape will be maintained. Approximately 1,000 acres of the Category 3 colonies will be located on private lands.
- ☐ The primary purpose of Category 3 Colonies is to provide a source for natural dispersal to Category 1 and 2 Prairie Dog Habitats following a plague outbreak and to provide a widespread geographic distribution of prairie dog colonies and their associated species across the TBNG.
- ☐ Priority is given to Category 3 Colonies which can serve to recolonize Category 1 and 2 Prairie Dog Habitats as well as colonies with a documented presence of species of concern such as burrowing owls and mountain plovers.
- ☐ These colonies are located approximately 10-20 km from Category 1 and 2 Prairie Dog Habitats. An abundance of Category 3 Colonies <7km from a Category 1 Prairie Dog Habitat was discouraged to provide a buffer zone which could slow the spread of plague.
- ☐ A distribution of approximately 500-1,000 acres of Category 3 Colonies will be maintained in isolation from Category 1 and 2 Prairie Dog Habitats to provide additional protection from a landscape wide plague epizootic as well as insure wide geographic distribution of prairie dogs.
- ☐ A colony will be considered isolated if it is >20km from a Category 1 or 2 Prairie Dog Habitat or separated by significant amounts of unsuitable habitat.
- ☐ Management actions will be considered if Category 3 Colonies fall below 500 acres or above 2000 acres. Regulated shooting could be allowed on all Category 3 Colonies.

D. Category 4 Habitats

Category 4 Prairie Dog Habitats are small isolated colonies which do not fall within the boundaries of Category 1 or 2 Prairie Dog Habitats and are north of Highway 450 and East of R67W. They also fall outside the TBGPEA potential CCAA area.

- ☐ Four thousand acres of Category 4 Colonies strategically located across the planning landscape will be maintained.
- ☐ The primary purpose of Category 4 Colonies is to provide a source for natural dispersal to Category 1 and 2 Prairie Dog Habitats following a plague outbreak and to provide a

widespread geographic distribution of prairie dog colonies and their associated species across the TBNG.

- ☐ Priority is given to Category 4 colonies which can serve to recolonize Category 1 and 2 Prairie Dog Habitats as well as colonies with a documented presence of species of concern such as burrowing owls and mountain plovers.
- ☐ These colonies are located approximately 10-20 km from Category 1 and 2 Prairie Dog Habitats. An abundance of Category 4 colonies <7km from a Category 1 Prairie Dog Habitat will be discouraged to provide a buffer zone which could slow the spread of plague.
- ☐ A distribution of Category 4 Colonies will be maintained in isolation from Category 1 and 2 Prairie Dog Habitats to provide additional protection from a landscape-wide plague epizootic as well as insure wide geographic distribution of prairie dogs.
- ☐ A colony will be considered isolated if it is >20km from a Category 1 or 2 Prairie Dog Habitat or separated by significant amounts of unsuitable habitat.
- ☐ Regulated shooting could be allowed on all Category 4 Colonies.

E. Colonies not in Category 1, 2, 3, or 4

- ☐ Coal Mine Area-colonies will not be scheduled for control and do not count toward category objectives but will be maintained until they are impacted by mining.
- ☐ New-colonies will be maintained until a review of their values is conducted and a determination of their designations is completed under the strategy.
- ☐ Control[A]-Colonies will be controlled on a priority basis as follows:
    1. Colonies close to residences where health and safety are a concern.
    2. Colonies expanding onto private land not in categories 1, 2, 3 or 4.
    3. Colonies expanding onto private land near boundaries of categories 1, 2, 3 or 4.
    4. Colonies getting close to private land.

Public Involvement

The Notice of Intent (NOI) was published in the *Federal Register* on March 13, 2007. The NOI asked for public comment on the proposal from March 13, 2007 to April 12, 2007. In addition, as part of the public involvement process, the Forest Service mailed a scoping letter and request for comments to 231 interested parties on March 9, 2007. News releases were also sent to local and statewide papers on March 9, 2007. A corrected NOI was published in the *Federal Register* on July 7, 2009.

Using the comments from the public, other agencies, and tribes (see *Issues* section), the interdisciplinary team developed a list of issues to address:

- Soils
- Use of Rodenticide
- Expansion onto private lands
- Loss of forage for permitted livestock
- Long term effects to prairie dog populations, ferrets, and other associated species.

Three alternatives were evaluated in the Draft Environmental Impact Statement (DEIS). The Notice of Availability of the DEIS was published on Dec. 21, 2007. To address public comments

[A] Control includes all management tools that limit or direct prairie dog expansion, not just rodenticide use.

on the DEIS, the Forest Service Interdisciplinary Team (IDT) developed two additional alternatives for evaluation in the FEIS.

Alternative 1

No Action

Under the No Action Alternative, the current management plan would continue to guide management of the project area.

- No changes would be made to the current LRMP;
- The proposed Black-tailed Prairie Dog Management Strategy (Appendix A) would be adopted and implemented with the following modifications:
    - There would be no designated Categories of prairie dog habitat; however, the MA 3.63 would be maintained.
    - The use of rodenticides is limited to two conditions: 1) Public health and safety risks; and 2) Damage to private and public facilities, such as cemeteries and residences. (LRMP pg. 1-23). Site-specific implementation of the application of rodenticides for these two conditions will be made according to the Decision screens as described in Appendix B1.
- All prairie dog management tools continue to be available, with emphasis given to the following:
    - Pursuing land exchanges or purchases that help to block up contiguous prairie dog habitat within or adjacent to the MA 3.63 Black-footed Ferret Reintroduction Habitat.
    - Implementing habitat enhancements or features that facilitate prairie dog population control through natural predation such as raptor nesting or perching structures.
    - Using prescribed burning to enhance prairie dog habitat and encourage prairie dog colony expansion.
    - Implementing grazing management strategies to include fencing (as appropriate) to discourage expansion of prairie dogs onto adjacent private lands.
    - Translocation will be used to enhance populations within MA 3.63 whenever feasible.
- Landscape level prairie dog management would be limited largely to management on federal lands with little or no prairie dog populations maintained on adjacent private lands.
- Black-footed Ferret Reintroduction Habitat (MA 3.63) would retain its current size and configuration, as allocated in the LRMP.
- Recreational Shooting outside of MA 3.63 would still be allowed.

Alternative 2

The Proposed Action

The Forest Service proposes the following actions to meet the purpose and need described above:

- Adopt and implement the proposed Prairie Dog Management Strategy described in Appendix A.
- All prairie dog management tools are available, with emphasis given to the following:
    - Discouraging unwanted prairie dog colonization by implementing alternative livestock grazing strategies within ½ mile of adjacent non-federal lands that encourage higher vegetation structure and create a visual barrier.
    - Encouraging conservation agreements that provide for occupied prairie dog habitat on adjacent or nearby non-federal lands.
    - Using approved rodenticides on prairie dog colonies under site-specific conditions/situations as outlined in the prairie dog management strategy (Appendix A), following the Decision Screens as described in Appendix B2.
- Amend the LRMP to support the implementation of the Black-tailed Prairie Dog Conservation Assessment and Strategy for the Thunder Basin National Grassland (Appendix A).
- Amend the LRMP to modify the boundary of Black-footed Ferret Reintroduction Habitat (MA 3.63). The modification of the boundary to the black-footed ferret reintroduction habitat area is proposed to provide a more biologically appropriate boundary for prairie dog colonies based upon topographical and biological barriers. It includes federal lands recently acquired through land exchange that provide additional suitable and historically occupied prairie dog habitat.
- Adjust the shooting prohibition area to mirror the adjusted MA 3.63 boundary on the south side. Shooting prohibitions would apply to NFS lands in Category 1 and 2 prairie dog habitat.
- The Forest Service would enter into a Candidate Conservation Agreement (CCA) with the USFWS to document Forest Service actions that would be undertaken to reduce or remove threats to the black-tailed prairie dog and associated species.

Alternative 3

Boundary management

This alternative was developed based on the August 3, 2005 Record of Decision made on the Nebraska National Forest (USFS, 2005) and on scoping comments from the public concerning issues with prairie dog encroachment onto adjacent private lands. This alternative is heavily reliant on the use of rodenticide as a means of resolving issues with prairie dog encroachment on private lands. No Prairie Dog Habitat categories will be established. **This alternative meets part of the purpose and need for addressing concerns about encroachment onto adjacent private lands but does not maintain viable populations of prairie dogs to support black-footed ferret reintroduction or for other associated species.** This alternative will also require reconsultation with USFWS on the LRMP concerning black-footed ferret as it will result in an adverse effect to this species' habitat.

Management activities within MA 3.63 will emphasize enhancement of prairie dog habitat to provide the largest population possible in the area greater than ½ mile from private land boundaries within MA 3.63.

Under Alternative 3:

- The proposed Prairie Dog Management Strategy (Appendix A) would not be adopted and implemented.
- Emphasis for prairie dog management across the TBNG would be on the use of rodenticides. Prairie dog colonies within ½ mile of private land/TBNG boundaries, including those occurring inside MA 3.63, would be controlled using various lethal and non-lethal methods. Site-specific implementation of rodenticide use will be made using the decision screen as found in Appendix B3.
- Livestock grazing on the TBNG would be managed to provide areas of high structure grassland along private land boundaries to deter remaining prairie dog populations from migrating from the TBNG to private lands. This would likely result in reductions of livestock numbers to maintain high structure in a large area.
- All prairie dog management tools continue to be available.
- Within MA 3.63 the following would be emphasized:
    - Land exchange opportunities will be actively sought and heavily emphasized to reduce areas of conflict with adjoining private land.
    - Plague management dusting will be used heavily within MA 3.63 to reduce plague impacts on the remaining population.
    - Prescribed burning will be used heavily within MA 3.63 to enhance habitat and keep prairie dogs within the MA to the extent possible.
    - Translocation will be used to enhance populations within MA 3.63 whenever feasible.

Alternative 4 (Environmentally Preferred)

Adjusted Management Area and Limited Rodenticide Use

Many comments from the public suggested possible limitations or modifications to the proposed action, and this alternative was developed to address these specific suggestions. This alternative allows for some potential use of rodenticides but ensures the continued growth of the prairie dog population. Based upon an average annual growth in occupied prairie dog habitat of 10% on the TBNG from 2002-2008, this alternative restricts rodenticide use to a maximum of 5% of the occupied colony acres per year in areas where unwanted colonization is occurring. If the annual occupied colony growth rate is negative, rodenticide use would be unavailable for that year. The decision screens in Appendix B4 would be used to determine the site specific use of rodenticide. This alternative will be highly reliant on non-lethal methods of control. It will emphasize prescribed burning, translocation and land exchanges as prairie dog management methods. This alternative meets the purpose and need. It also addresses those comments from the public that the additional lands acquired in land exchange should be added to the MA 3.63 without changing the configuration of the area on the north and west sides of the current MA 3.63.

Under Alternative 4, the stated purpose and need would be met through the following:

- The proposed Prairie Dog Management Strategy (Appendix A) would be adopted and implemented with the following modifications:
    - The use of rodenticides on an annual basis is limited to not more than 5% of the active prairie dog colony acres and only if prairie dog colonies have grown to meet or exceed the previous year's inventory (by acres) and adds the following direction. Site specific implementation of the use of the management tools will be made following the Decision Screens as found in Appendix B4.
- All colonies
    - Except for reasons of health and public safety, use of rodenticides is unavailable anywhere on the TBNG until the total acres of active prairie dog colonies exceed 10,000 acres in Category 1 (MA 3.63).
    - Except for reasons of health and public safety, use of rodenticides is unavailable in first year after decision in order to implement appropriate proactive measures to reduce or eliminate conflicts surrounding prairie dog expansion with adjacent non-federal land owners.
    - All prairie dog colony acres controlled through the use of rodenticides will be deferred from livestock grazing to allow for the development of high vegetation structure and adequate visual barriers.
    - Use of rodenticides will be:
        - available to protect public health and safety and existing facilities.
        - unavailable to control prairie dog population densities.
        - unavailable for other situations.

- **Category 1 Habitat**
    - Use of rodenticides:
        - available within ¼ mile of adjacent non-federal lands, only after the acreage of active prairie dog colonies exceeds 18,000 acres within Category 1 (MA 2.1 and MA 3.63).
    - Prairie dog shooting prohibitions
        - Shooting prohibited in the enlarged Category 1 area (MA 3.63).

- **Category 2**
    - Use of rodenticides:
        - available within ¼ mile of non-participating adjacent non-federal lands
    - Prairie dog shooting prohibitions
        - Prairie dog shooting prohibited on NFS acres.
        - Private lands open to shooting as determined by the landowner and the USFWS as documented in a CCAA

- **Categories 3, 4 and Other Prairie Dog Colonies**
    - Use of rodenticides:
        - available for problem colonies within ¼ mile of adjacent non-federal lands
    - Prairie dog shooting prohibitions
        - Prairie dog shooting allowed only on those colonies identified for lethal control

- All prairie dog management tools are available, with emphasis given to the following:
  - Implementing alternative livestock grazing strategies within ½ mile of adjacent non-federal lands that encourage higher vegetation structure and create a visual barrier to prairie dog colonization.
  - Supporting conservation easements that provide for occupied prairie dog habitat on adjacent or nearby non-federal lands.
  - Actively translocating prairie dogs from within the TBNG that potentially will expand onto adjacent non-federal land, to suitable, unoccupied prairie dog habitat within the Black-footed Ferret Reintroduction Habitat.
  - Pursuing Land exchanges or purchases that help to block up contiguous prairie dog habitat within or adjacent to the MA 3.63 Black-footed Ferret Reintroduction Habitat.
  - Prescribed burning to enhance prairie dog habitat and encourage prairie dog colony expansion.
- The boundary of Black-footed Ferret Reintroduction Habitat (MA 3.63) would be modified from the current plan to include additional lands acquired in land exchange as described in the proposed action. The remaining portion of the boundary would remain the same as Alternative 1-No Action.
- Amend the LRMP to support the Black-tailed Prairie Dog Conservation Assessment and Strategy for the TBNG (Appendix A, as modified by this alternative).
- Incorporate additional shooting restriction areas to all prairie dog colonies on NFS lands except those that are scheduled for lethal control.
- The Forest Service would enter into a Candidate Conservation Agreement (CCA) with the USFWS to document Forest Service actions that would be undertaken to reduce or remove threats to the black-tailed prairie dog and associated species.

Alternative 5 (Preferred)

Additional Category 2 Areas

This alternative was developed based on public comments that additional Category 2 management areas beyond those identified in Alternative 2 should be identified and managed on the TBNG. This alternative meets the purpose and need.

Under Alternative 5:

- The proposed Prairie Dog Management Strategy (Appendix A) would be adopted and implemented with the following modifications:
  - The site-specific strategy would be modified to include three additional Category 2 areas. These additional areas are known as North 450, South Cellers and Piney Creek.
  - Prairie Dog shooting would be prohibited on all NFS lands within one Category 1 area and five Category 2 areas.
- The boundary of Black-footed Ferret Reintroduction Habitat (MA 3.63) would be modified as described in Alternative 2-Proposed Action.

- Objective of a total of 9,000 acres of occupied prairie dog habitat on NFS and private lands within the five Category 2 areas.
- All prairie dog management tools are available, with emphasis given to the following:
    - Implementing alternative livestock grazing strategies within ½ mile of adjacent non-federal lands that encourage higher vegetation structure and create a visual barrier to prairie dog colonization.
    - Encouraging conservation agreements that provide for occupied prairie dog habitat on adjacent or nearby non-federal lands.
    - Using approved rodenticides on prairie dog colonies under site-specific conditions/situations as outlined in the prairie dog management strategy (Appendix A), following the Decision Screens as described in Appendix B2.
- The Forest Service would enter into a Candidate Conservation Agreement (CCA) with the USFWS to document Forest Service actions that would be undertaken to reduce or remove threats to the black-tailed prairie dog and associated species.

Decisions To Be Made

Based upon the effects of the alternatives, the responsible official will decide:

1. Whether or not to change conditions under which rodenticide treatment may be allowed.
2. Whether or not to change the boundary of the Black-footed Ferret Reintroduction Habitat (MA 3.63) and other management areas surrounding the Black-footed Ferret Reintroduction Habitat and amend standards and guidelines in the LRMP.
3. Whether or not to complete a Candidate Conservation Agreement with the USFWS or a Memorandum of Understanding with other agencies and landowners as outlined in the Prairie Dog Management Strategy.
4. Whether or not to implement changes in shooting restrictions by alternative.
5. Whether or not to adopt the Prairie Dog Management Strategy (Appendix A), or as modified.

Table of Contents

List of Tables

List of Figures

CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

Document Structure

The Forest Service has prepared this Environmental Impact Statement in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Impact Statement discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters:

Chapter 1. Purpose and Need for Action: This chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area.

Chapter 4. Consultation and Coordination: This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement.

Chapter 5. Literature Cited: This chapter provides a list of scientific literature used in the development of the EIS.

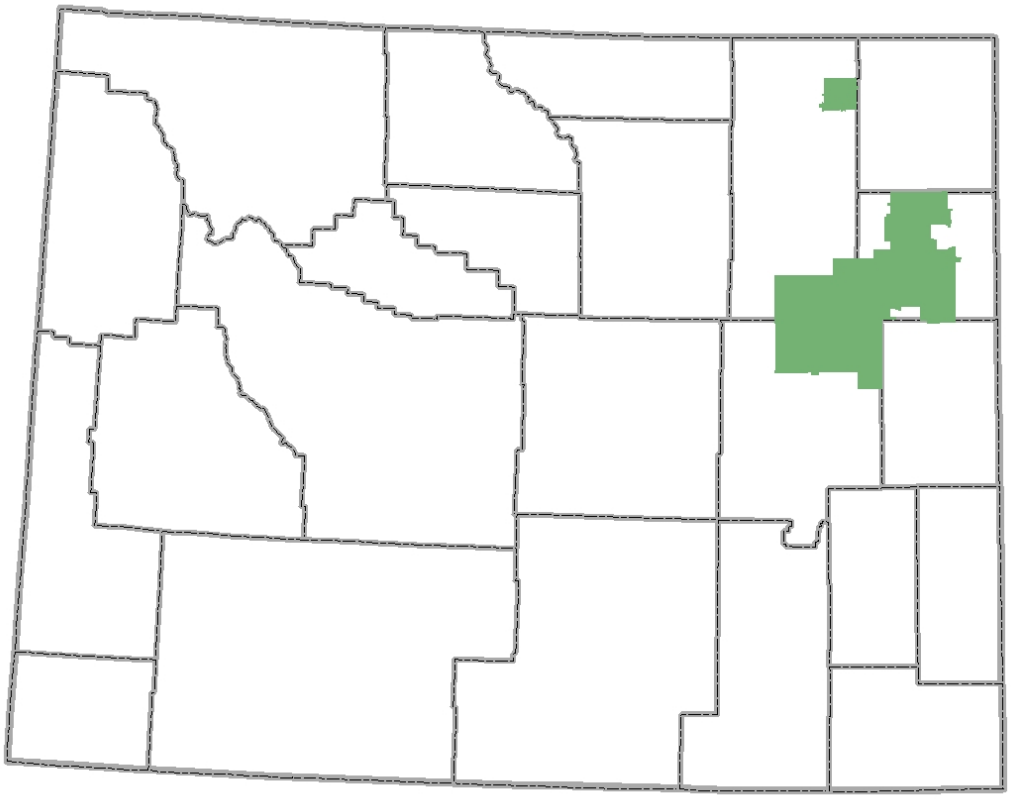
Appendices: The appendices provide more detailed information to support the analyses presented in the environmental impact statement.

Additional documentation may be found in the project planning record located at the Douglas Ranger District Office.

Background

This project is located on the Thunder Basin National Grassland (TBNG). The TBNG is comprised of approximately 553,000 acres of NFS lands, intermingled with over 1 million private and state lands. TBNG is in Northeast Wyoming, including portions of Campbell, Converse, Niobrara, and Weston counties, within the Powder River Basin. The Powder River Basin is a topographic depression situated between the Bighorn Mountains to the west, the Laramie Mountains to the south and west, the Black Hills and Hartville Uplift to the east, and is open to the north in southeast Montana. Elevations within the basin range from around 6,000 feet along the Rochelle Hills Escarpment in the western portion of the basin to about 3,000 feet along the eastern border.

Figure 1: Location of the TBNG



Prairie Dog Management on the TBNG

Since the 1960's, the Forest Service has been challenged to balance the conservation of prairie dog populations and habitat with the management of potential adverse impacts of prairie dogs moving from public lands to neighboring private lands. Following is a history of prairie dog management on the TBNG:

1960s - Early 1970s, prairie dog colonies limited through annual use of rodenticide.

1972 - Certain rodenticides banned by Presidential Executive Order 11643.

1981 - Rodenticide use resumed with the use of a newly developed rodenticide formulation (2% zinc phosphide on steam-rolled oats, EPA Label Registration No. 6704-74).

1981-1985 - Prairie dog colonies were treated under a prairie dog management plan developed in 1981.

1988 - National Black-footed Ferret Recovery Plan signed.

1985-1998 – Medicine Bow National Forest LRMP (1985) prairie dog management direction:

- Prairie dog towns that are contiguous with private lands or those within ¼ mile of private lands where it is determined that prairie dogs may cause unacceptable damage to private lands will be controlled with zinc phosphide or other approved chemical.

- Prairie dog towns more than ¼ mile from private land and on federal land tracts of more than 640 acres will be retained and usually reduced in size to 80-100 acres of active prairie dog colonies if larger than 100 acres.
- In 1985 there was an estimated acreage of 11,000 acres of active prairie dog colonies on the TBNG.

1998 - The black-tailed prairie dog was petitioned for listing under the Endangered Species Act (ESA).

2000 - The Forest Service, as directed by Chief's letter dated July 26, 2000, prohibited poisoning of prairie dogs on National Forest System lands pending the U.S. Fish and Wildlife Service (USFWS) decision on the ESA petition.

2000 - The USFWS designated the black-tailed prairie dog as a candidate for listing as a threatened species under the ESA. The USFWS had concluded that listing of this species for federal protection under the ESA was "warranted" but precluded listing due to other priorities.

2000 - The Forest Service limited the use of prairie dog rodenticide to situations involving public health and safety risks and damage to facilities.

2001 - TBNG revised 2001 LRMP and July, 2002 Record of Decision (ROD) continue to limit the use of prairie dog rodenticide to situations involving public health and safety risks and damage to facilities.

2002 - A plague epizootic on Thunder Basin in April and May 2002 reduced prairie dog colonies from an estimated 21,000 acres of active colonies in 2001 to about 3,300 acres of active colonies in 2002.

February 12, 2004 - Forest Service rescinded the policy letter regarding use of prairie dog rodenticide on National Forest System lands.

May 5, 2004 - The U.S. Department of Agriculture's discretionary review of the Chief's appeal decisions on the Thunder Basin National Grassland LRMP directed the Forest Service to work with state and county officials and local landowners to aggressively implement the spirit and intent of the good neighbor policy.

May 11, 2004 – The Rocky Mountain Regional Forester, Rick Cables, discussed prairie dog management, in his letter to the Chief of the Forest Service, stating in part:

> "As part of being a good neighbor, aggressive management actions will be taken to achieve LRMP objectives and minimize conflicts with adjacent landowners. We will accelerate active management of unwanted colonization by applying appropriate tools. Prairie dog conservation plans developed by the states will be consulted for guidance on the appropriate response to unwanted colonization onto adjacent non-federal lands."

August, 2004 - the USFWS removed the black tailed prairie dog from the candidate list by Federal Register Notice on August 18, 2004 (Vol. 69, No. 159 pages 51217-51226).

2002-2005 - Prairie dog colony acreages increased from 4,324 acres in 2002 to 15,531 acres in 2005.

2006-2008-Prairie dog populations declined to 6,500 acres in 2006, down to 3,243 acres in 2007 and back up to 4,000 acres in 2008.

2007-On August 6, 2007 A new petition to list the black-tailed prairie dog under ESA was received by the USFWS.

2008-On December 2, 2008 the USFWS issued a 90 day finding "that the petition presents substantial information indicating that listing the black-tailed prairie dog under the Act

> may be warranted based on threats associated with Factor C (sylvatic plague), Factor D (inadequate Federal and State regulations), and Factor E (poisoning).Therefore, we are initiating a status review to determine whether listing the black-tailed prairie dog under the Act is warranted." (Federal Register, Vol. 73, No. 232)

Many ranchers and farmers who live in prairie dog habitat feel their livelihoods are negatively affected by prairie dogs. Most land currently inhabited by prairie dogs is privately owned. Many ranchers view prairie dogs as a problem and think they compete for forage and destroy good rangeland; their goal has been eradication. Reeve and Vosburgh (2006) reported that 95% of landowners in Wyoming try to reduce colonies and 54% strive to eliminate them.

If prairie dogs would be allowed to survive on private lands adjacent to federal lands, allowing connectivity to be maintained or increased promoting prairie dog movement across the landscape. Private landowners near federal lands can play a key role in the conservation of prairie dogs, and are pivotal to the future of prairie dogs (Sidle et al, 2006).

The impetus for establishing a Prairie Dog Management Strategy for the TBNG is that with better conservation of prairie dogs on federal land there would be fewer conflicts with ranchers on private land, and therefore there should be fewer requests for rodenticide use. By implementing the strategy, in cooperation with TBGPEA, it is likely that more acreage of prairie dog colonies would be maintained on private land. There would be an overall net gain for prairie dog conservation, by allowing limited rodenticide use on federal land in exchange for thousands of acres of private land managed for prairie dog colony maintenance and expansion. Conservation of prairie dogs will be more successful if federal land managers collaborate with ranchers to meet all interests. Conservation efforts will certainly fail if we don't work together (Hoogland, 2006b)

Existing Conditions

The Forest Service has identified suitable prairie dog habitat based on the suitability model used in the LRMP's FEIS (p. 3-264). Suitable habitat is based on slope (less than 30% slope), soils and vegetation (see FEIS pp. B-31, B-32, and B-34 for a list of "suitable" vegetation types). In classifying prairie dog habitat suitability, a site was classified as preferred habitat only if all four variables (vegetation, soil, slope, and water) were rated as preferred. If one variable was rated suitable but marginal, the entire site was rated marginal. If one variable was rated unsuitable, the entire site was rated unsuitable.

Forest and wetland vegetation types were considered unsuitable for prairie dogs. Grassland vegetation types including those with minor shrub components were considered preferred habitat. Since black-tailed prairie dogs also occur in shrublands and modify shrublands by removing shrubs in and around their colonies, shrublands were considered suitable but marginal habitat.

Slopes with suitable soils and vegetation that were less than 10% slope were considered preferred habitat. Slopes ranging from 10 to 30% were classified as suitable but marginal habitat. Areas with average slopes exceeding 30% were identified as unsuitable.

All water and wetlands were classified as unsuitable for prairie dog colonization. Areas with shallow water tables were also classified as unsuitable.

The Thunder Basin analysis used vegetation classified from the USDA Forest Service Pueblo Integrated Resource Inventory (IRI) Center. Each type was classified for prairie dog suitability.

This suitability model classified 405,000 acres (92%) of Thunder Basin as potentially suitable habitat for prairie dog colonization.

Prairie dog management continues to be an important and controversial subject on the TBNG. The Forest Service has an obligation under the ESA to enhance the recovery of endangered species like the black-footed ferret and under the National Forest Management Act (NFMA) to maintain viable populations of sensitive species and species that may be impacted by Forest Service management. Many of these species are associated with occupied prairie dog habitat. The amount and distribution of this habitat condition is influenced by ungulate grazing, drought, predation, disease, and the use of rodenticides.

Grazing and drought reduce vegetation height and thereby vegetation structure and favor prairie dog colonization and expansion. Reduced levels of grazing may create higher vegetation structure that may deter prairie dog colonization and expansion due to increased vegetation height. Disease and rodenticide use could prevent prairie dog population expansion almost entirely.

Although prairie dogs are a native component of this grassland ecosystem, their utilization of grasses and forbs often leads to conflict with domestic livestock grazing as expanding prairie dog populations may create unwanted colonization on private lands adjacent to the TBNG. Currently, there are approximately 400 to 1,100 acres of prairie dog colonies that are a source of conflict with neighboring private landowners. In addition, many ranchers are concerned that prairie dog utilization of grasses and forbs may create competition for forage with domestic livestock. Continued conflicts erode public support for a reintroduction of black-footed ferrets on the TBNG due to fears concerning conflicts with unwanted colonization of prairie dogs and loss of forage on private lands from prairie dogs and the concern about being able to limit these impacts once an endangered species is reintroduced into the area. Landowners have also expressed concerns about the proximity of plague infested colonies to private residences. There are currently five occupied residences within 1 mile of prairie dog colonies on the TBNG.

The presence of sylvatic plague in the TBNG prairie dog colonies further confounds the ability to manage for viable populations of black-tailed prairie dogs at levels required to sustain black-footed ferret populations. As plague cycles through the area, it has highlighted the need to manage these prairie dog colonies in a more holistic way, looking beyond jurisdictional boundaries to manage for prairie dog colonies and complexes on an ecosystem basis. To further this effort, the Forest Service has been collaborating on an ecosystem based management strategy with neighboring private landowners, WGFD, and USFWS. This effort may be documented in Candidate Conservation Agreements with Assurances (CCAA) with the USFWS if an acceptable management strategy is adopted by the Forest Service. Likewise, the TBNG may enter into a Candidate Conservation Agreement (CCA) with the USFWS for NFS lands if an

acceptable strategy is adopted. The intent of the strategy would be to manage for prairie dog colonies over multiple ownerships providing for a wider distribution of prairie dogs across the landscape and facilitating recovery following plague events. In order to implement this strategy and build public confidence that effective action will be taken to resolve legitimate complaints, the Forest Service needs to be able to use both lethal and non-lethal management tools. This proposed strategy is summarized under the proposed action and the complete strategy is in Appendix A.

Following the plague epizootic in 2001, total active prairie dog colony area increased from 2002 levels of 4,324 acres (post plague) to 15,531 acres in 2005. Since that time and with reoccurrence of plague epizootics, the population has fluctuated up and down and is currently estimated to be 4,000 acres. More information regarding prairie dog populations can be found in Chapter 3, Section 3.1.

The Forest Service has acquired lands through land exchange that provide suitable prairie dog habitat and will enhance the Black-footed Ferret Reintroduction Habitat (MA 3.63). Additional habitat analysis since the completion of the LRMP indicates that there are lands currently within MA 3.63 that are not capable of supporting prairie dog colonies. Adjusting the MA 3.63 boundary based on topographical and biological barriers for prairie dog colonies and including lands recently acquired through land exchange would allow for application of appropriate management tools in specific locations and situations to reduce management conflicts.

As of August of 2009, the State of Wyoming has not adopted a Black-tailed Prairie Dog Management Plan for the state.

Desired Conditions

The desired condition on the TBNG is to provide for viable populations of black-tailed prairie dogs, widely distributed across the planning area while minimizing conflicts with neighboring private lands. These populations are expected to provide habitat for the black-footed ferret to meet our obligations under the Endangered Species Act and the goals and objectives established in the LRMP (pgs 1-2 to 1-3 and 3-16). Direction from the Black-footed Ferret Recovery Plan and pertinent LRMP direction is contained below.

Goal 1: Ensure Sustainable Ecosystems
Promote ecosystem health and conservation using a collaborative approach to sustain the Nation's forests, grasslands and watersheds.

Goal 1.b: Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS).

Objectives:

1. As scientific information becomes available, jointly develop with the US Fish and Wildlife Service and other agencies conservation and recovery strategies for plant and animal species, listed as threatened or endangered under the Endangered Species Act, and implement established conservation or recovery strategies over the life of the Plan.

2. Within 15 years, demonstrate positive trends in population viability, habitat availability, habitat quality, population distribution throughout the species range within the planning area, and other factors affecting threatened, endangered, sensitive species and MIS.
3. Develop and implement conservation strategies for Forest Service sensitive species, as technical information becomes available. (LRMP pgs 1-2 to 1-3).

Geographic Area (GA) Direction

Broken Hills GA (LRMP pgs 2-2 to 2-8)
Habitat suitability and effectiveness will be maintained for key wildlife species. Prairie dog colonies will be maintained or increased.

Objectives

1. Maintain an increasing trend of black-tailed prairie dog populations across the geographic area over the next 10 to 15 years. **Objective**
2. Maintain and expand the current distribution of black-tailed prairie dogs across the geographic area over the next 10 to15 years. **Objective**
3. Improve the complex of prairie dog colonies (10 or more colonies with distances between nearest colonies not exceeding 6 miles) in the central part of this geographic area over the next 10 to 15 years. This area has been designated as MA 3.63. **Objective**
4. To help increase prairie dog populations and habitat for associated species, allow and encourage expansion of the prairie dog colony complex (10 or more colonies with a total colony acreage of at least 1,000 acres and intercolony distances of less than 6 miles) in the central portion of this geographic area over the next 10 to 15 years. Colonies protected by conservation agreements or easements on adjoining land jurisdictions, including private, may be considered part of a complex. **Objective**

Standards and Guidelines

1. Emphasize an active landownership adjustment program adjacent to the complex, throughout the geographic area in an attempt to reduce private land conflicts over prairie dog management and to enhance long-term management opportunities for expanding prairie dog populations in this area. Landownership adjustments may need to be completed in some locations before implementation of some actions to accelerate prairie dog population growth. **Guideline**
2. A range of 23,616 to 31,488 acres of low structure grasslands is prescribed for this geographic area. Much of this acreage should be located in the northeast portion of the geographic area in areas adjoining existing colonies and where prairie dog colonies are known to have occurred in the recent past. This will accelerate expansion of existing colonies and re-establishment of past colonies that are not along private land boundaries. **Guideline**

Cellers Rosecrans GA (LRMP pgs 2-9 to 2-20)
Management direction in Special Interest Areas will emphasize cultural and zoological resources. Plant and animal species and communities associated with black-footed ferrets and black-tailed prairie dogs will be actively restored.

Objectives

1. Maintain an increasing trend of black-tailed prairie dog populations across the geographic area over the next 10 to 15 years. **Objective**
2. Maintain and expand the current distribution of black-tailed prairie dogs across the geographic area over the next 10 to15 years. **Objective**
3. Improve the complex of prairie dog colonies (10 or more colonies with distances between nearest colonies not exceeding 6 miles) in the southwestern part of this geographic area over the next 10 to 15 years. This area has been designated as MA 3.63. **Objective**
4. To help increase prairie dog populations and habitat for associated species, allow and encourage expansion of the prairie dog colony complex (10 or more colonies with a total colony acreage of at least 1,000 acres and intercolony distances of less than 6 miles) in the central portion of this geographic area over the next 10 to 15 years. Colonies protected by conservation agreements or easements on adjoining land jurisdictions, including private, may be considered part of a complex. **Objective**

Standards and Guidelines

1. Emphasize an active landownership adjustment program adjacent to the complex, throughout the geographic area in an attempt to reduce private land conflicts over prairie dog management and to enhance long-term management opportunities for expanding prairie dog populations in this area. Landownership adjustments may need to be completed in some locations before implementation of some actions to accelerate prairie dog population growth. **Guideline**
2. A range of 36,324 to 42,378 acres of low structure grasslands is prescribed for this geographic area. Much of this acreage should be located in the northeast portion of the geographic area in areas adjoining existing colonies and where prairie dog colonies are known to have occurred in the recent past. This will accelerate expansion of existing colonies and re-establishment of past colonies that are not along private land boundaries. **Guideline**

Management Area 3.63 (MA 3.63) Black-footed Ferret Reintroduction Habitat (LRMP p 3-16)

Large prairie dog colony complexes are established and maintained as suitable habitat for black-footed ferret reintroductions. Land uses and resource management activities are conducted in a manner that is compatible with maintaining suitable black-footed ferret habitat. The Forest Service works with other agencies and organizations to pursue conservation agreements or easements with adjoining land jurisdictions to achieve black-footed ferret recovery objectives. Where landownership patterns are not conducive to effective and successful prairie dog and black-footed ferret management, landownership adjustments with willing landowners may also be used to help resolve management issues. The USFWS determines many of the conditions including when and where black-footed ferrets will be released.

National Black-footed Ferret Recovery Plan

The current (1988) Recovery Plan established an objective to ensure the immediate survival of the black-footed ferret by:

1) Increasing the captive population of black-footed ferrets to a census size of 200 breeding adults by 1991;
2) Establishing a prebreeding census population of 1,500 free-ranging black-footed ferret breeding adults in 10 or more populations with no fewer than 30 breeding adults in any population by the year 2010; and
3) Encourage the widest possible distribution of reintroduced black-footed ferret populations.

The Recovery Plan is currently being updated and revised to incorporate recent information. This revision, currently in draft (2007 Revised Recovery Plan), maintains the goal for free ranging ferret populations of establishing a pre-breeding population of 1,500 black-footed ferrets in 10 or more populations with no fewer than 30 breeding adults in any population. Such a population goal might contain 2/3 female and 1/3 males with the females being a reasonable gauge to determine needed acreage since ferrets exhibit considerable within gender territoriality, but much less territorially between genders. Thus, if sufficient habitat is provided for female ferrets, the males seem to overlap and not require separate additional habitat. The revised plan estimates that a pre-breeding population of 1,500 free ranging ferrets would require approximately 185,000 acres of occupied prairie dog colonies. Based on information collected from successful reintroduction sites, prairie dog colonies can support an average density of one adult ferret per 99-148 acres in quality habitat. Given the propensity for drought at TBNG and the typically decline in prairie dog densities that accompanies drought, it is reasonable for the TBNG Plan to provide 200 acres of habitat per adult female. Using these numbers established in the 2007 draft Recovery Plan along with on site knowledge at TBNG, a minimum viable population of ferrets for TBNG would be expected to be supported on 4,000 acres of quality habitat. This is derived from providing 200 acres for 20 adult females and recognizing that 10 adult male territories should also be supported on that same acreage. The colonies should be within 1.5 kilometers of adjacent colonies to maximize complex configuration to benefit ferret movements. If the distance between colonies becomes significantly larger 1.5 kilometers, it becomes more challenging for ferrets to move between colonies and utilize the habitat.

In plague prone areas, supporting the minimum 4,000 acre goal may require management options like insecticide applications to control flea populations or vaccinations to minimize the effects of plague. Additionally, new tools are continually being evaluated that may provide additional options for future plague management. The TBNG will evaluate new plague management tools and incorporate as appropriate into LRMPs.

According to Miller et al. (2007) an adult population of 200 ferrets, which could be supported on a black-tailed prairie dog complex of about 15,600 acres (6,500 ha) would have a high probability of persistence over a period of about 100 years.

A successful reintroduction of black-footed ferrets into MA 3.63 would contribute to recovery of the species.

Regional Forester Rick Cables' (May 8, 2007) Letter to Forest Supervisors for increased participation in Black-footed Ferret Recovery.

> "Additional reintroduction sites are needed to make better progress toward recovery objectives. Finding or even establishing large complexes of black-tailed prairie dog colonies is often problematic. Most black-tailed prairie dog colonies are small and scattered across the landscape. FWS is indicating that smaller complexes of black-tailed prairie dog colonies (1,500 to 3,000 acres) can play an increasingly important role in national recovery by supporting small nursery populations of black-footed ferrets."

Regional Forester Rick Cables'(May 11, 2004) Response to Secretary of Agriculture Discretionary Review of Appeals on Revised Thunder Basin NG and Nebraska NF Land and Resource Management Plans

> "As part of being a good neighbor, aggressive management actions will be taken to achieve LRMP objectives and minimize conflicts with adjacent landowners. We will accelerate black-footed ferret reintroduction and active management of unwanted prairie dog colonization by applying appropriate tools."

Purpose and Need for Action

To meet TBNG 2001 LRMP Grassland-wide Goals and Objectives (Goal 1.b, Objective 1), the desired conditions prescribed under the MA 3.63 direction, the Broken Hills GA and Cellers Rosecrans GA direction, and the Chief's LRMP appeal direction, and to contribute to the goals established in the 1988 National Black-footed Ferret Recovery Plan, the purpose of the proposed action is to establish and maintain the public support and biological environment needed to facilitate the reintroduction of black-footed ferrets on the TBNG.

To achieve this purpose, the Forest Service has identified the need to:

- Proactively manage prairie dog populations on the TBNG in an environmentally, biologically, and socially acceptable manner that provides for the long-term conservation of black-tailed prairie dogs and other species associated with prairie dog colonies,

- Manage prairie dog populations, colonies and complexes on the TBNG in adequate acreages and distributions to provide habitat conditions that support future reintroductions of black-footed ferrets.

- Manage prairie dogs and their habitat to minimize unwanted colonization onto adjoining private and State lands and to address local landowner concerns about possible losses of agricultural production, costs of controlling prairie dogs, effects on land values, and risks to human and animal health and safety that may occur if prairie dogs colonize adjacent non-federal lands.

- Gain local landowner and state of Wyoming support for a prairie dog management strategy on the TBNG that provides for the biological needs of the black-footed ferret and minimizes potential adverse impacts to adjacent non-federal landowners.

Based on the purpose and need to gain local landowner support for the management of prairie dogs and black-footed ferrets, local landowners and other interested parties and the Forest

Service had initial discussions on possible management of prairie dogs in the TBNG area. Based on these discussions, the group decided to develop a Prairie Dog Management Strategy.

Black-tailed Prairie Dog Conservation Assessment and Management Strategy Summary (Appendix A)

From June 2005 through 2006, individuals from the Forest Service, Thunder Basin Grasslands Prairie Ecosystem Association, WGFD, Bureau of Land Management, US Fish and Wildlife Service, and Environmental Defense worked to develop a collaborative prairie dog management strategy. This strategy was developed at a landscape scale to define how prairie dogs could be managed and conserved over multiple land ownerships. In addition to prairie dog habitats on public lands, private landowners have agreed to maintain prairie dog habitats on their private lands. Private land habitats will be documented through Candidate Conservation Agreements with assurances. Following is a summary of this strategy.

A. Category 1 Prairie Dog Habitat

- ☐ A single Category 1 Prairie Dog Habitat will be maintained within the planning landscape and will be included within the Black-footed Ferret Reintroduction Habitat (MA 3.63).
- ☐ The Category 1 Prairie Dog Habitat is designed to be an adequate size and spatial configuration to sustain a viable population of black-footed ferrets.
- ☐ The Category 1 Prairie Dog Habitat has a management objective of at least 18,000 acres of active prairie dog colonies. It is anticipated that 18,000 acres will be sufficient habitat to allow ferrets the opportunity to persist through a future plague epizootic and recover naturally along with the prairie dog populations. The acreage in Category 1 is not capped at 18,000 acres, but would be allowed to grow within the boundary of the MA 3.63. The 18,000 acre objective only serves as a potential trigger point if prairie dogs are expanding onto adjacent private lands.
- ☐ Each colony within the Category 1 Prairie Dog Habitat will conform to the 1.5 km "rule" so that each colony is no more than 1.5 km from another colony within the Prairie Dog Habitat.
- ☐ The location of the Category 1 Prairie Dog Habitat is based on the current and historical distribution of prairie dogs across the planning landscape as well as areas most suitable as prairie dog habitat as defined by slope, vegetation and soil characteristics.
- ☐ Secondly, Category 1 Prairie Dog Habitat was sited so as to utilize, to the maximum extent feasible, public lands such as TBNG.
- ☐ Natural barriers to prairie dog expansion such as large areas of unsuitable habitat were utilized to the maximum extent feasible to bound the Category 1 Prairie Dog Habitat.

Category 1 Prairie Dog Habitat - Control[A] and Management

- ☐ Within Category 1 (MA 3.63), prairie dogs will be allowed to disperse and colonize new areas naturally.
- ☐ Any prairie dog control efforts within MA 3.63 proposing to use rodenticides may only be initiated if cumulative acreage of active prairie dog colonies within Category 1 exceeds 18,000 acres. Use of rodenticide on federal lands may only be employed within ½ mile of

[A] Control includes all management tools that limit or direct prairie dog expansion, not just rodenticide use.

the TBNG boundary, and only in cases where non-lethal options have been tried and exhausted. Translocations to suitable areas will be a preferred method of control.

- ☐ In areas where no natural barriers exist, a buffer of ungrazed or lightly grazed areas will be used to discourage colonization out of the designated Category 1Prairie Dog Habitat (MA 3.63).
- ☐ If and when control becomes necessary along TBNG boundaries within the Category 1 area, selection of colonies to be controlled will be based on habitat values to black-footed ferrets as well as the ages of the colonies
- ☐ Category 1 Prairie Dog Habitat will be considered core habitat area. Recreational shooting of prairie dogs would be prohibited year round within a Category 1 Prairie Dog Habitat (MA 3.63).
- ☐ If active prairie dog acreage falls below 10,000 acres within Category 1 Prairie Dog Habitat, translocations will be considered.

B. Category 2 Prairie Dog Habitat

- ☐ Two Category 2 Prairie Dog Habitats will be maintained within the planning landscape. Both of these Category 2 habitats will be located almost entirely on private lands.
- ☐ Category 2 Habitats are necessary to provide an adequate distribution of prairie dogs and their associated species across the landscape and provide some level of protection against a landscape-wide plague epizootic.
- ☐ Category 2 Habitats will contribute to sustaining viable populations of prairie dogs and their associated species (with the exception of black-footed ferrets).
- ☐ Each Category 2 Prairie Dog Habitat has a management objective of a minimum of 1,500 acres of active prairie dog colonies within 7 km of each other. Combined, Category 2 Prairie Dog Habitats have a management objective of 7,000 acres of active prairie dog colonies.
- ☐ The purpose of the Category 2 Prairie Dog Habitat is to provide for viable populations of prairie dogs and their associated species as well as provide significant ecological diversity at the landscape scale.
- ☐ Category 2 Habitat may be composed of clusters of a few large colonies, or more numerous smaller colonies. The sizes of individual colonies within Category 2 Habitat will vary according to natural variation and to meet the needs of various associated wildlife species.
- ☐ Colony sizes and configurations which have been demonstrated to minimize the severity of a plague outbreak will be preferred and managed for.
- ☐ Locations for Category 2 Prairie Dog Habitats are based on habitat suitability as well as the current and historical distribution of prairie dogs (See 'Defining Habitat Suitability'), known presence of associated species, or are considered high value habitat for other reasons.
- ☐ At least one Category 2 was located as far as possible from the Category 1 Prairie Dog Habitat to reduce and/or slow the spread of a plague epizootic and provide some redundancy in the system.

Category 2 Prairie Dog Habitat - Control and Management

- ☐ Translocations will be considered if any individual Category 2 Prairie Dog Habitat falls below 500 acres *or* total Category 2 acreage falls below 1,500 acres.

- In the event that Category 2 acreage exceeds 7,000 acres, control of colonies within Category 2 areas could be considered. In such cases, newer colonies and colonies with lower habitat value for associated species would be prioritized for control efforts.
- Rodenticide use may occur on Category 2 Prairie Dog Habitats in a manner that is consistent with the specified goals of each Category 2 Prairie Dog Habitat and consistent with incentive agreements.
- Prairie dog control efforts may only be initiated if cumulative acreage of active prairie dog colonies on Category 2 lands exceeds 7,000 acres. Lethal control on federal lands may only be employed within ½ mile of TBNG boundary, in cases where non-lethal options have been tried and exhausted. Translocations to suitable areas will be a preferred method of control.
- Regulated shooting could be allowed on Category 2 Prairie Dog Habitats so long as it is not found to compromise the ecological objectives of these areas. Use of full-metal jacket bullets is recommended to reduce possible secondary lead poisoning.
- The locations and boundaries of Category 2 Prairie Dog Habitats may change and shift depending on prairie dog activity, new information, or other management objectives.

C. Category 3 Habitats

Category 3 Prairie Dog Habitats are small isolated colonies which do not fall within the boundaries of Category 1 or 2 Prairie Dog Habitats and occur south of Highway 450 and east of R67W. They also fall within the TBGPEA potential CCAA area.

- Two thousand acres of Category 3 Colonies strategically located across the planning landscape will be maintained. Approximately 1,000 acres of the Category 3 colonies will be located on private lands.
- The primary purpose of Category 3 Colonies is to provide a source for natural dispersal to Category 1 and 2 Prairie Dog Habitats following a plague outbreak and to provide a widespread geographic distribution of prairie dog colonies and their associated species across the TBNG.
- Priority is given to Category 3 Colonies which can serve to recolonize Category 1 and 2 Prairie Dog Habitats as well as colonies with a documented presence of species of concern such as burrowing owls and mountain plovers.
- These colonies are located approximately 10-20 km from Category 1 and 2 Prairie Dog Habitats. An abundance of Category 3 Colonies <7km from a Category 1 Prairie Dog Habitat was discouraged to provide a buffer zone which could slow the spread of plague.
- A distribution of approximately 500-1,000 acres of Category 3 Colonies will be maintained in isolation from Category 1 and 2 Prairie Dog Habitats to provide additional protection from a landscape wide plague epizootic as well as insure wide geographic distribution of prairie dogs.
- A colony will be considered isolated if it is >20km from a Category 1 or 2 Prairie Dog Habitat or separated by significant amounts of unsuitable habitat.
- Management actions will be considered if Category 3 Colonies fall below 500 acres or above 2000 acres. Regulated shooting could be allowed on all Category 3 Colonies.

D. Category 4 Habitats

Category 4 Prairie Dog Habitats are small isolated colonies which do not fall within the boundaries of Category 1 or 2 Prairie Dog Habitats and are north of Highway 450 and East of R67W. They also fall outside the TBGPEA potential CCAA area.

- ☐ Four thousand acres of Category 4 Colonies strategically located across the planning landscape will be maintained.
- ☐ The primary purpose of Category 4 Colonies is to provide a source for natural dispersal to Category 1 and 2 Prairie Dog Habitats following a plague outbreak and to provide a widespread geographic distribution of prairie dog colonies and their associated species across the TBNG.
- ☐ Priority is given to Category 4 Colonies which can serve to recolonize Category 1 and 2 Prairie Dog Habitats as well as colonies with a documented presence of species of concern such as burrowing owls and mountain plovers.
- ☐ These colonies are located approximately 10-20 km from Category 1 and 2 Prairie Dog Habitats. An abundance of Category 4 Colonies <7km from a Category 1 Prairie Dog Habitat will be discouraged to provide a buffer zone which could slow the spread of plague.
- ☐ A distribution of Category 4 Colonies will be maintained in isolation from Category 1 and 2 Prairie Dog Habitats to provide additional protection from a landscape-wide plague epizootic as well as insure wide geographic distribution of prairie dogs.
- ☐ A colony will be considered isolated if it is >20km from a Category 1 or 2 Prairie Dog Habitat or separated by significant amounts of unsuitable habitat.
- ☐ Regulated shooting could be allowed on all Category 4 Colonies.

E. Colonies not in Category 1, 2, 3, or 4

- ☐ Coal Mine Area-colonies will not be scheduled for control and do not count toward category objectives but will be maintained until they are impacted by mining.
- ☐ New-colonies will be maintained until a review of their values is conducted and a determination of their designations is completed under the strategy.
- ☐ Control[A]-Colonies will be controlled on a priority basis as follows:
    1. Colonies close to residences where health and safety are a concern.
    2. Colonies expanding onto private land not in categories 1, 2, 3 or 4.
    3. Colonies expanding onto private land near boundaries of categories 1, 2, 3 or 4.
    4. Colonies getting close to private land.

Proposed Action

The Forest Service proposes the following actions to meet the purpose and need described below:

- Adopt and implement a Black-tailed Prairie Dog Conservation Assessment and Strategy for the Thunder Basin National Grassland which provides overall direction on managing for viable populations of prairie dogs and their habitat in support of the future reintroduction of black-footed ferrets and to provide habitat for ferrets and other associated species. It includes guidance for use of lethal or non-lethal management tools in site-specific situations, such as encouraging prairie dog expansion into unoccupied suitable habitat or reducing unwanted colonization of prairie dogs on adjoining private lands along TBNG boundaries.

[A] Control includes all management tools that limit or direct prairie dog expansion, not just rodenticide use.

- Amend the Thunder Basin National Grassland Land and Resource Management Plan (LRMP) standards and guidelines as needed to support the Black-tailed Prairie Dog Conservation Assessment and Strategy and to modify the boundary of the Black-footed Ferret Reintroduction Habitat (MA 3.63). The proposed boundary modification of the Black-footed Ferret Reintroduction Habitat is necessary to provide a more biologically appropriate boundary for prairie dog colonies based upon topographical and biological barriers. It includes federal lands recently acquired through land exchange that provide additional suitable and historically occupied prairie dog habitat.

Methods for implementing the proposed actions include a spectrum of non-lethal and lethal management tools such as: reduced livestock grazing to create visual barriers, live-trapping and potential translocations, landownership adjustment through land exchanges, third-party solutions such as financial incentives and conservation agreements or easements, physical barriers to deter prairie dog expansion, limited use of rodenticide, and limited shooting of prairie dogs.

Non-lethal management tools include landownership adjustment and third party solutions. Landownership adjustment allows for land trades to result in most prairie dog towns occurring on the property of willing landowners. Third party solutions involve other government agencies or private organizations that provide innovative solutions to site-specific prairie dog management issues. These solutions include but are not limited to financial incentives, conservation agreements and conservation easements with willing landowners to help conserve prairie dogs on their lands and on the Thunder Basin. Other non-lethal tools that may be effective and used in a limited number of situations are live-trapping and prairie dog barriers, both visual and physical. Visual barriers could consist of vegetation zones where livestock grazing is reduced or excluded to increase the height and density of grassland vegetation. Physical barriers are typically multi-strand fences, including electric fence, which prairie dogs will approach but cannot physically penetrate.

Lethal management tools include use of rodenticide and limited shooting in selected colonies to reduce unwanted expansion. Prairie dog shooting is regulated by state wildlife agencies. However, in 2003 the Forest Service issued a recreational shooting restriction in the TBNG Black-footed Ferret Reintroduction Habitat following a plague epizootic. This shooting restriction would remain in effect.

The scope of this proposal is limited to those actions described above. Other issues related to black-tailed prairie dog or black-footed ferret conservation and management in the project area are outside the scope of this proposed action.

Decisions To Be Made

Given the purpose and need, the deciding official reviews the proposed action, the other alternatives, and the environmental consequences in order to make the following decisions:

Based upon the effects of the alternatives, the responsible official will decide:

1. Whether or not to change conditions under which rodenticide treatment may be allowed.

2. Whether or not to change the boundary of the Black-footed Ferret Reintroduction Habitat (MA 3.63) and other management areas surrounding the Black-footed Ferret Reintroduction Habitat and amend standards and guidelines in the LRMP.
3. Whether or not to complete a Candidate Conservation Agreement with the USFWS or a Memorandum of Understanding with other agencies and landowners as outlined in the Prairie Dog Management Strategy.
4. Whether or not to implement changes in shooting restrictions by alternative.
5. Whether or not to adopt the Prairie Dog Management Strategy (Appendix A), or as modified.

Public Involvement

The Notice of Intent (NOI) was published in the Federal Register on March 13, 2007. The NOI asked for public comment on the proposal from March 13, 2007 to April 12, 2007. In addition, as part of the public involvement process, the agency mailed a scoping and request for comments to 231 interested parties on March 9, 2007. News releases were also sent to local and statewide papers on March 9, 2007. The project was published in the Schedule of Proposed Actions on April 1, 2007.

Using the comments from the public, other agencies, and tribes (see *Issues* section), the interdisciplinary team developed a list of issues to address.

The Notice of Availability for the Draft Environmental Impact Statement was published in the Federal Register on December 21, 2007. Notices of the availability were sent to interested parties that had previously responded. Approximately 400 interested parties provided responses to the Draft EIS.

Based on these comments the Forest Service has developed several additional alternatives to the proposed action, these comments and the responses can be found in Appendix D.

Issues

The Forest Service separated the issues into two groups: key and non-key issues. Key issues were defined as those directly or indirectly caused by implementing the proposed action. Key issues were also used to develop alternatives to the proposed action. Non-key issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, or other rulemaking or agency policy; 3) statements of opinion or preference; or 4) conjectural statements not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant (key) or which have been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant (non-key) issues and reasons regarding their categorization as non-significant may be found in the record located at the Douglas Ranger District Office.

The Forest Service identified the following key issues as a result of scoping:

Soils: The proposal will increase the size of prairie dog towns and may cause more soil erosion. Indicator: Acres of prairie dog colonies with potential for soil erosion. Effects analyzed in all Alternatives.

Use of Rodenticide is Inappropriate: The use of rodenticides may adversely impact the black-footed ferret and other wildlife and may not be an appropriate control method. Indicator: Acres of potential rodenticide treatment. Emphasized in the No Action Alternative.

Expansion onto private lands: The proposal may impact the amount of prairie dog colony expansion on adjacent private lands. Indicator: Acres of potential prairie dog colonies expanding onto adjacent private lands. Effects analyzed in all action alternatives and emphasized in Boundary Management Alternative.

Loss of Forage for permitted livestock: The proposal may impact the amount of forage available to livestock permitted to graze on National Forest System lands. Indicator: Amount of forage available for livestock. Effects analyzed in all Alternatives.

Long Term Effects to prairie dogs, black-footed ferrets and other associated species: The proposal may impact prairie dog populations which would impact the ability to reintroduce black-footed ferrets and impact the viability of other species associated with prairie dog habitat. Effects analyzed in all action alternatives.

Other Related Efforts

Other related analyses in the area include the Thunder Basin Analysis Area Vegetation Management Environmental Impact Statement, the Inyan Kara Analysis Area Vegetation Management Environmental Assessment, the Spring Creek Geographic Area Vegetation Environmental Assessment and the Thunder Basin National Grassland Travel Management Analysis. Also the Thunder Basin Grasslands Prairie Ecosystem Association, a local group of private landowners and minerals companies, is currently working on a landscape scale planning effort to maintain viability of species across multiple land ownerships. This area overlaps a portion of the TBNG.

The Thunder Basin Grasslands Prairie Ecosystem Association is in the process of developing a Candidate Conservation Agreement with Assurances (CCAA) for many prairie species including the black-tailed prairie dog and associated species for the areas identified in Categories 2 and 3 in the proposed action that are located on private lands. A CCAA is an agreement between the US Fish and Wildlife Service and a non-federal landowner under the authority of Section 10 of the Endangered Species Act. In the CCAA the non-federal owner voluntarily commits to implement specific conservation measures for species covered by the agreement in exchange for a permit from the USFWS which provides assurances that additional conservation measures will not be required if the species becomes listed in the future. Parts of Categories 1, 2, and 3 prairie dog habitats fall within this potential CCAA.

In addition, the 4W Ranch FLP has developed a CCAA for black-tailed prairie dog and other associated species. This final agreement was signed on February 9, 2009 for a term of 10 years with allowances for termination of the agreement with 60 days notice by either party. This agreement covers the private lands in the North Category 2 area outlined in the proposed action (Alternative 2).

After adoption of a prairie dog management strategy for TBNG the Forest Service intends to enter into a Candidate Conservation Agreement (CCA) with US Fish and Wildlife Service for prairie dog management across the entire TBNG. A CCA is a voluntary conservation agreement

between the USFWS and one or more federal agencies and potentially additional non-federal landowners. The USFWS works with its partners to identify threats to candidate species, plan the measures needed to address the threats and conserve these species, identify willing landowners, develop agreements, and design and implement conservation measures and monitor their effectiveness (USFWS, 2009c). This Environmental Impact Statement will serve as the required NEPA compliance for a CCA between the Forest Service and the US Fish and Wildlife Service.

CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Introduction

This Chapter describes and compares the alternatives considered for the implementation of the TBNG Prairie Dog Management Strategy. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

Alternatives Considered in Detail

The Forest Service developed three alternatives, including the No Action, Proposed Action, and Boundary Management alternatives, in response to issues raised by the public during scoping. Based on comments received on the Draft EIS, the Forest Service has identified two additional alternatives.

Management Tools:

Each alternative incorporates many prairie dog management tools. Following is a brief description of the management tools included in the alternatives (in alphabetical order). A complete discussion of each management tool can be found in the draft Prairie Dog Management Strategy (Appendix A). A comparison of the expected use of each tool by alternative can be found in Table 5.

Conservation Agreements
Candidate Conservation Agreements (CCAs) are voluntary conservation agreements between the USFWS, one or more federal agencies and potentially additional non-federal landowners. The USFWS works with its partners to identify threats to candidate species, plan the measures needed to address the threats and conserve these species, identify willing landowners, develop agreements, and design and implement conservation measures and monitor their effectiveness (USFWS, 2009c)

Candidate Conservation Agreements with Assurances (CCAAs) are similar to CCAs but can only be completed with non-federal parties.

Conservation Easements
In the context of this document, a conservation easement is an agreement between two parties such as the U.S. Government or non-governmental organization and a private landowner, wherein a prairie dog colony on private land is tolerated in return for a payment to the landowner. Currently the U.S. Fish and Wildlife Service is considering developing such a program. The terms and conditions of such easements have yet to be determined.

Land Exchange or Purchase

The U.S. Forest Service can exchange like-value land parcels with willing landowners. The US Forest Service can purchase land or work with a non-governmental organization to purchase lands for conservation objectives.

Plague Management

Dusting and Vaccination

It is unrealistic that plague (*Yersinia pestis*) can be eliminated from North America. The use of pesticides to reduce flea populations, which spread plague within prairie dog colonies and complexes, provides some hope of reducing outbreaks. However, repeated dusting of burrows with pesticides (e.g., Deltadust) is labor intensive and perhaps not practical for large colonies and complexes (Roelle, et.al, 2005). It may be justified in high-value areas, such as ferret reintroduction sites. Results suggest that flea control from dusting may afford some protection in a prairie dog colony, but may not eliminate plague from the system. Because of this, vaccination of ferrets is necessary before and after reintroduction. This same plague vaccine is being developed for use in prairie dogs, but an effective oral bait delivery system is not yet feasible (USFWS, 2008).

Spatial Distribution of prairie dog complexes

The best conservation strategy against plague is to maintain many colonies of prairie dogs distributed through out their geographic range (Cully et al., 2006). This makes conservation of prairie dogs on private lands key, as 87% of all prairie dog habitat is on private land (Luce et al, 2006). If prairie dogs would be allowed to survive on private lands adjacent to federal lands, allowing connectivity to be maintained or increased promoting prairie dog movement across the landscape. This would result in larger complexes that are less likely to become extinct and more able to recolonize deserted colonies. (Sidle et al, 2006)

Predator Enhancement

Enhancement of predator habitat has often been suggested as a means of prairie dog control. On the TBNG, raptor nest platforms can be placed in prairie dog colonies to encourage raptors to prey on prairie dogs. However, raptors and other predators also prey on ferrets. So the use of this tool will consider the potential adverse affects to this species.

Prescribed Burning

Burning grassland creates favorable habitat for black-tailed prairie dogs, and fire has been used to manage the rate and direction of colony expansion (Milne-Laux and Sweitzer, 2006).

Prescribed Grazing

Black-tailed prairie dogs prefer areas with low vegetative structure. These sites can be created by mowing, but are most often associated with concentrated livestock grazing. Prairie dog burrow density at sites with both prairie dogs and cattle was twice as high as burrow density at sites with just prairie dogs. Resting pastures or portions of pastures from livestock grazing can significantly decrease prairie dog populations and discourage prairie dog colonization (USFS, 2004).

Significant numbers of prairie dog colonies can encompass or adjoin cattle point attractants, such as water sources. The existence of cattle point attractants may encourage prairie dog colonization.

Recreational Shooting

Recreational shooting of prairie dogs, at least in small colonies, seems to affect population structure and reproductive performance as evidenced by skewed sex ratios against males and lack of breeding yearlings in disturbed colonies. It is estimated that recreational shooters killed 1.23 million prairie dogs on non-tribal land in South Dakota in 2000 (USFS 2004). The TBNG currently has placed a special order to prohibit recreational shooting of prairie dogs on National Forest System lands within and around the Black-footed Ferret Reintroduction Habitat (MA 3.63). This order was coordinated with the U.S. Fish and Wildlife Service and the WGFD (see LRMP p. 1-16) when it was completed in 2002 and with the WGFD when it was renewed in 2008.

Rodenticide (Chemical Control)

The only rodenticide approved for use on prairie dogs on the TBNG is zinc phosphide. Based on label and LRMP restrictions, the only time period that zinc phosphide-treated oats can be applied is between October 1 and December 31. Typically, untreated oats are first placed at each burrow within a colony. Three days later, oats coated with zinc phosphide are placed at these same burrows. Approximately 90% of a colony's prairie dogs are typically killed. If this process is repeated within the following few years, it can be very effective at eliminating colonies from undesired areas (Forrest and Luchsinger, 2006).

Translocation

New prairie dog colonies can be established by translocating the animals to prepared sites. The art and science of such efforts continues to evolve (Long et al, 2006).

The WGFD must be contacted prior to any translocation efforts so that a permit may be obtained. A permit from the Food and Drug Administration (FDA) must be obtained as well, as there are existing restrictions on the interstate and intrastate movement of prairie dogs. The TBNG and the WGFD have been cooperating in outlining the appropriate steps to be taken to facilitate successful translocations of prairie dogs.

Visual Barriers

Prairie dogs rely on open vistas to detect predators and to communicate with fellow colony members. Various visual barriers can be used to discourage colony establishment and expansion, but no barrier system is 100% effective. Barriers should be set up before emergence of juvenile prairie dogs in early to mid May. The most commonly used visual barriers are vinyl fencing, privacy fencing, or vegetation.

Vinyl barriers discourage prairie dog movement by obstructing their line of sight. Vinyl is generally effective for about five years, so it should be used in conjunction with other more permanent methods like vegetation. The vinyl must be opaque, stabilized in the ground, and able to withstand some extreme weather conditions. Chicken wire must then be installed on the prairie dog side to discourage them from chewing through the vinyl.

Privacy fencing entails using wood-slatted fencing at least 3 feet high. The fence needs to also have chicken wire installed on the prairie dog side, and some kind of edging strips into the soil along the bottom to prevent light from penetrating. Dead pine boughs or burlap can be laid against these fences to help with the visual barrier aspect.

High structure vegetation can be very effective at stopping prairie dog colony expansion. Grasses, shrubs, trees, can all be used. Based on field review on the TBNG, vegetation that has a "Visual Obstruction Reading" of 3 inches or more is effective (USFS, 2004). This level of structure is typically produced in lightly or moderately grazed areas, idle areas, hayland (before mowing), and in Conservation Reserve Program ("CRP") fields.

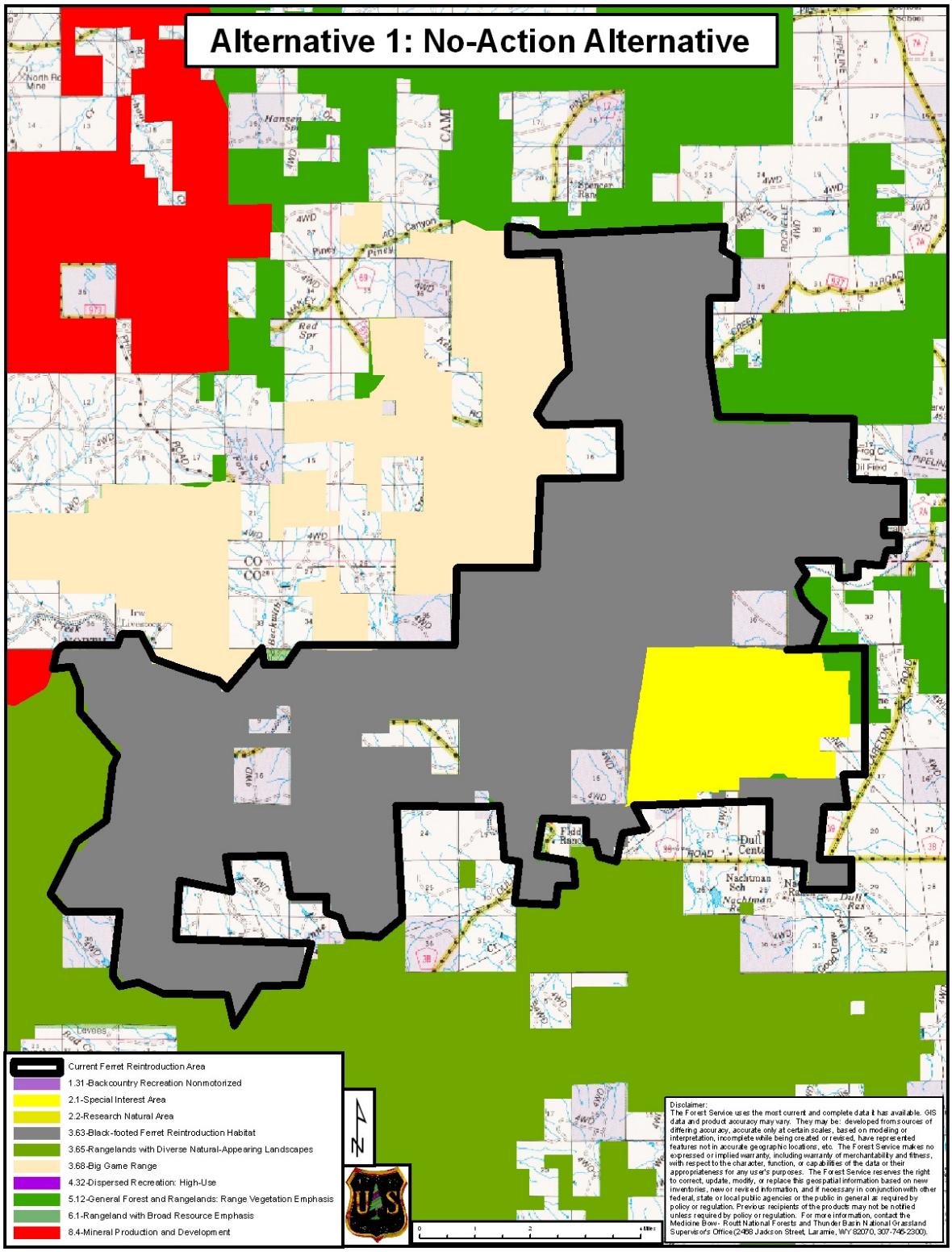
Alternative 1

No Action

Under the No Action Alternative, the current management plan would continue to guide management of the project area.

- No changes would be made to the current LRMP;
- The proposed Prairie Dog Management Strategy (Appendix A) would be adopted and implemented with the following modifications:
    - There would be no designated Categories of prairie dog habitat; however, the MA 3.63 would be maintained.
    - The use of rodenticides is limited to two conditions: 1) Public health and safety risks; and 2) Damage to private and public facilities, such as cemeteries and residences. (LRMP pg. 1-23). Site-specific implementation of the application of rodenticides for these two conditions will be made according to the Decision screens as described in Appendix B1.
- All prairie dog management tools continue to be available, with emphasis given to the following:
    - Pursuing land exchanges or purchases that help to block up contiguous prairie dog habitat within or adjacent to the MA 3.63 Black-footed Ferret Reintroduction Habitat.
    - Implementing habitat enhancements or features that facilitate prairie dog population control through natural predation such as raptor nesting or perching structures.
    - Using prescribed burning to enhance prairie dog habitat and encourage prairie dog colony expansion.
    - Implementing grazing management strategies to include fencing (as appropriate) to discourage expansion of prairie dogs onto adjacent private lands.
    - Translocation will be used to enhance populations within MA 3.63 whenever feasible.
- Landscape level prairie dog management would be limited largely to management on federal lands with little or no prairie dog populations maintained on adjacent private lands.
- Black-footed Ferret Reintroduction Habitat (MA 3.63) would retain its current size and configuration, as allocated in the LRMP.
- Recreational Shooting outside of MA 3.63 would still be allowed.

Figure 2: Current Size and Configuration of Black-Footed Ferret Habitat and other Management areas in the LRMP



Alternative 2

The Proposed Action

The Forest Service proposes the following actions to meet the purpose and need described above:

- Adopt and implement the proposed Prairie Dog Management Strategy described in Appendix A.
- All prairie dog management tools are available, with emphasis given to the following:
  - Discouraging unwanted prairie dog colonization by implementing alternative livestock grazing strategies within ½ mile of adjacent non-federal lands that encourage higher vegetation structure and create a visual barrier.
  - Encouraging conservation agreements that provide for occupied prairie dog habitat on adjacent or nearby non-federal lands.
  - Using approved rodenticides on prairie dog colonies under site-specific conditions/situations as outlined in the prairie dog management strategy (Appendix A), following the Decision Screens as described in Appendix B2.
- Amend the LRMP to support the implementation of the Black-tailed Prairie Dog Conservation Assessment and Strategy for the TBNG (Appendix A).
- Amend the LRMP to modify the boundary of Black-footed Ferret Reintroduction Habitat (MA 3.63). The modification of the boundary to the black-footed ferret reintroduction habitat area is proposed to provide a more biologically appropriate boundary for prairie dog colonies based upon topographical and biological barriers. It includes federal lands recently acquired through land exchange that provide additional suitable and historically occupied prairie dog habitat.
- Adjust the shooting prohibition area to mirror the adjusted MA 3.63 boundary on the south side. Shooting prohibitions would apply to NFS lands in Category 1 and 2 prairie dog habitat.
- The Forest Service would enter into a Candidate Conservation Agreement (CCA) with the USFWS to document Forest Service actions that would be undertaken to reduce or remove threats to the black-tailed prairie dog and associated species.

Figure 3 and Figure 4 show the current and historical extent of prairie dog colonies and their categorical designations for Alternative 2.

Figure 3: Alternative 2-Current Extent of Prairie Dog Colonies by Category

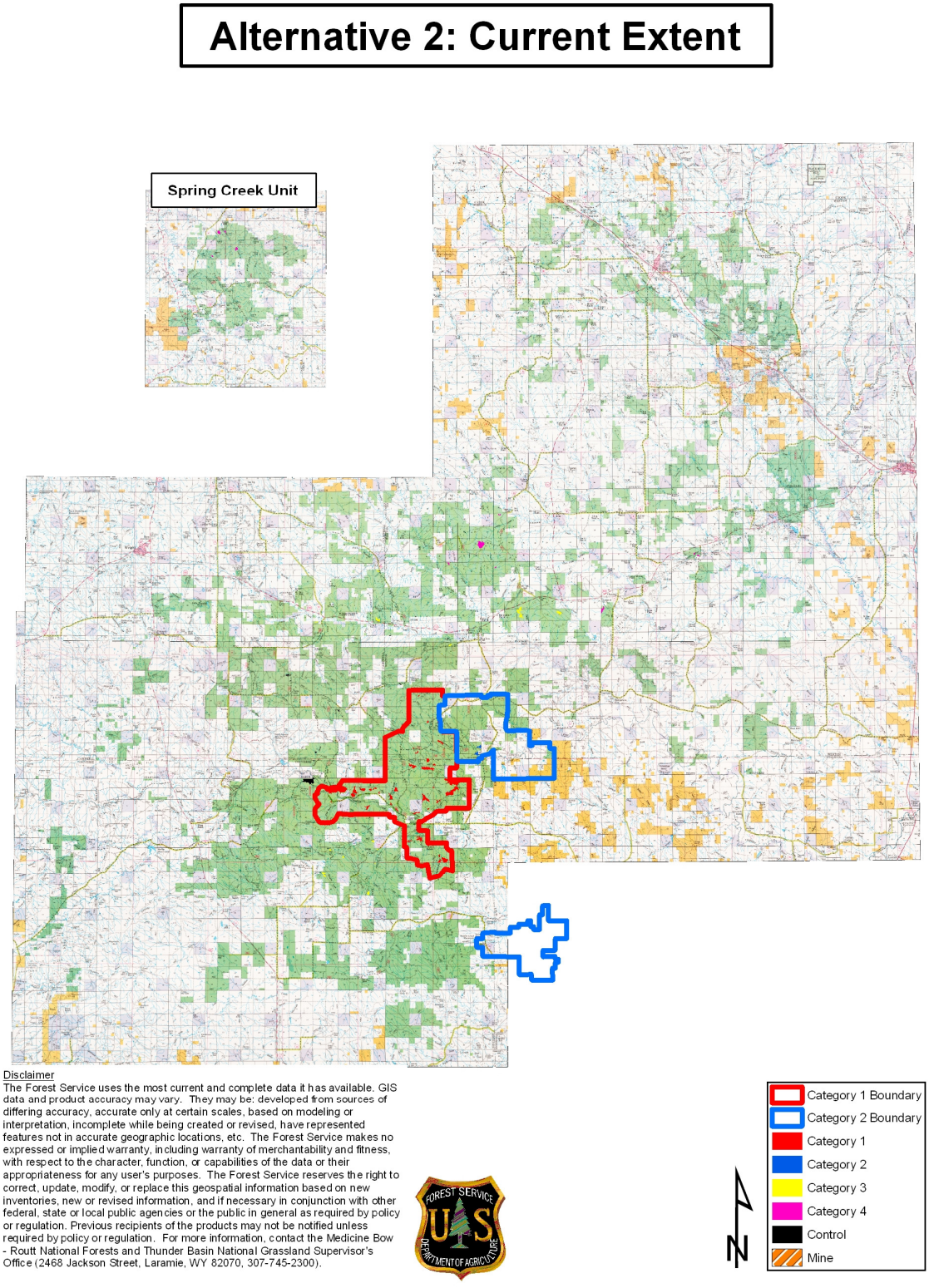
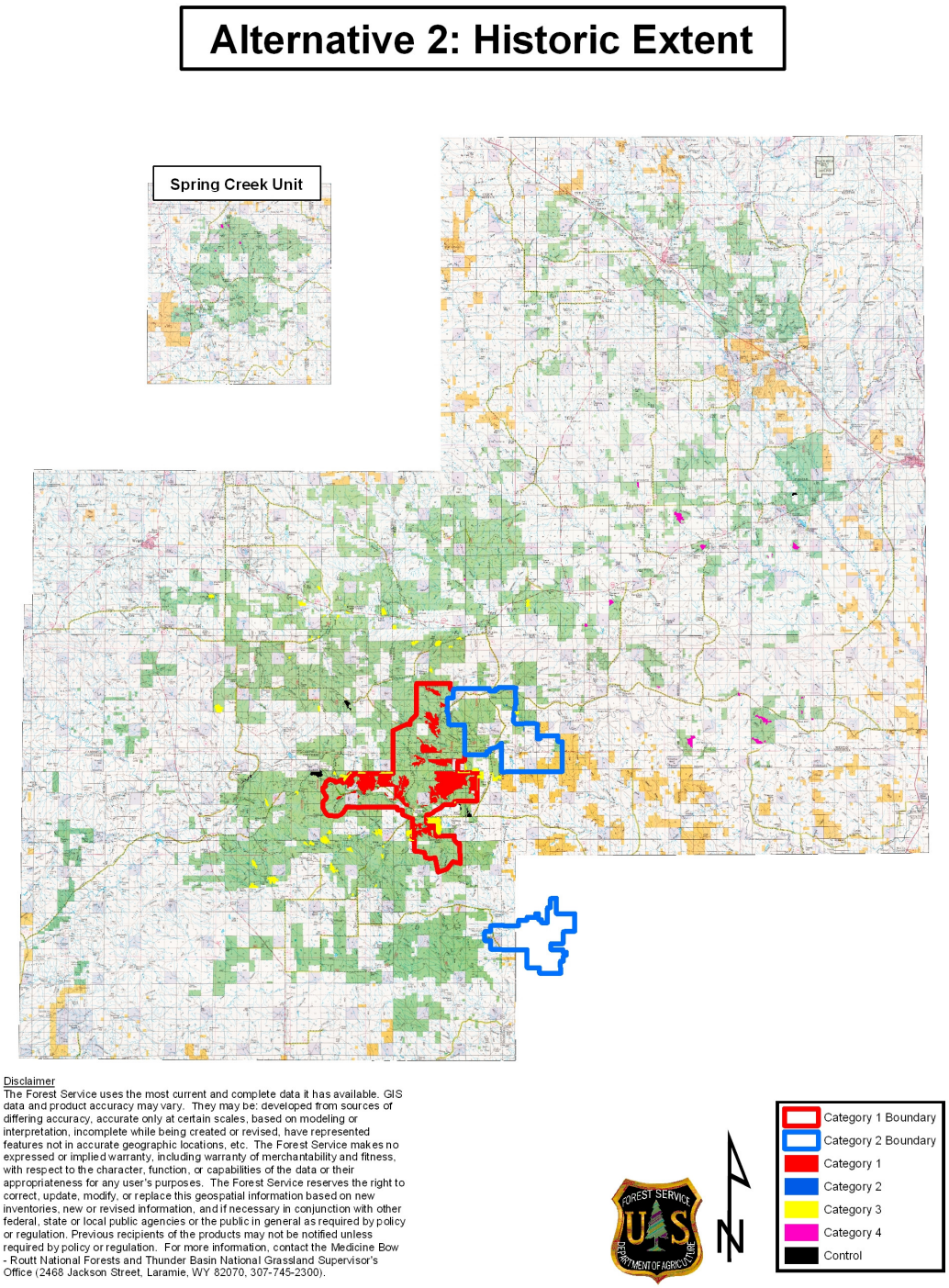


Figure 4: Alternative 2-Historical Extent of Prairie Dogs by Category



Land and Resource Management Plan Amendment

The following table identifies current LRMP direction that is proposed to be deleted (left column) under this action. This current direction will be revised, replaced in whole, or have no replacement direction (right column).

Table 1: LRMP Amendment, changes from current direction under Alternative 2.

Item #	Delete:	Revise or Replace With:
#1	**Chapter 1, F-21**. Any net loss of suitable black-footed ferret habitat as a result of prairie dog poisoning or development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the poisoning or development. **Standard**	**Chapter 1, F-21 (revised)**. Any net loss of suitable black-footed ferret habitat as a result of development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the development. **Standard**
#2	**Chapter 1, H-1.** 1. Prohibit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. **Standard**	**Chapter 1, H-1 (revised).** 1. Limit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. ▪ On prairie dog colonies that are expanding on to neighboring private lands where they are not wanted. ▪ Colonies outside Categories 1, 2, 3, and 4 (as identified in strategy) if the Forest Service determines they are not needed for habitat for prairie dogs, black-footed ferrets or other associated species. **Standard**
#3	**Chapter 1, H-2**. Consult state-wide prairie dog conservation strategies for additional guidance on the appropriate response to complaints of unwanted prairie dog colonization on adjoining agricultural lands (private, state, and tribal lands). **Guideline**	**Chapter 1, H-2 (revised)**. In consultation with the Wyoming Game and Fish Department, determine the appropriate response to complaints of unwanted colonization on adjoining private and state lands. A spectrum of management tools will be considered based on site-specific evaluations. **Guideline**

<table>
<tr><th>Item #</th><th>Delete:</th><th>Revise or Replace With:</th></tr>
<tr><td>#4</td><td>Chapter 2, Broken Hills Geographic Area Management Area Prescription Allocation
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<tr><th>Number</th><th>Prescription</th><th>Acres</th></tr>
<tr><td>1.31</td><td>Backcountry Recreation Nonmotorized</td><td>6,545</td></tr>
<tr><td>2.1</td><td>Special Interest Area</td><td>14,170</td></tr>
<tr><td>3.63</td><td>Black-footed Ferret Reintroduction Habitat</td><td>13,619</td></tr>
<tr><td>3.65</td><td>Rangelands with Diverse Natural-Appearing Landscapes</td><td>71,100</td></tr>
<tr><td>3.68</td><td>Big Game Range</td><td>18,426</td></tr>
<tr><td>5.12</td><td>General Forest and Rangeland</td><td>33,577</td></tr>
</table>
As shown on the map for the LRMP, which is a part of the LRMP</td><td>Chapter 2, Broken Hills Geographic Area Management Area Prescription Allocation
<table>
<tr><th>Number</th><th>Prescription</th><th>Acres</th></tr>
<tr><td>1.31</td><td>Backcountry Recreation Nonmotorized</td><td>6,545</td></tr>
<tr><td>2.1</td><td>Special Interest Area</td><td>14,170</td></tr>
<tr><td>3.63</td><td>Black-footed Ferret Reintroduction Habitat</td><td>13,751</td></tr>
<tr><td>3.65</td><td>Rangelands with Diverse Natural-Appearing Landscapes</td><td>70,968</td></tr>
<tr><td>3.68</td><td>Big Game Range</td><td>18,426</td></tr>
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</table>
As shown on Appendix C-map</td></tr>
<tr><td>#5</td><td>Chapter 2, Cellers Rosecrans Geographic Area Management Area Prescription Allocation
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<tr><th>Number</th><th>Prescription</th><th>Acres</th></tr>
<tr><td>2.1</td><td>Special Interest Area</td><td>6,940</td></tr>
<tr><td>2.2</td><td>Research Natural Areas</td><td>1,213</td></tr>
<tr><td>3.63</td><td>Black-footed Ferret Reintroduction Habitat</td><td>34,275</td></tr>
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As shown on the map for the LRMP, which is a part of the LRMP</td><td>Chapter 2, Cellers Rosecrans Geographic Area Management Area Prescription Allocation
<table>
<tr><th>Number</th><th>Prescription</th><th>Acres</th></tr>
<tr><td>2.1</td><td>Special Interest Area</td><td>6,940</td></tr>
<tr><td>2.2</td><td>Research Natural Areas</td><td>1,213</td></tr>
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<tr><td>5.12</td><td>General Forest and Rangeland</td><td>78,413</td></tr>
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As shown on Appendix C Map</td></tr>
<tr><td>#6</td><td>Chapter 3, Management Area 3.63, General – 1. Authorize only those uses and activities that do not reduce the suitability of the area as black-footed ferret reintroduction habitat. Standard</td><td>Chapter 3, Management Area 3.63, General – 1 (revised). Authorize only those uses and activities in the reintroduction area that do not reduce habitat below the level needed to support a long-term sustainable black-footed ferret population.

Until habitat is available to support a long-term sustainable black-footed ferret population, do not authorize uses and activities that would prevent increases in the prairie dog population. Standard</td></tr>
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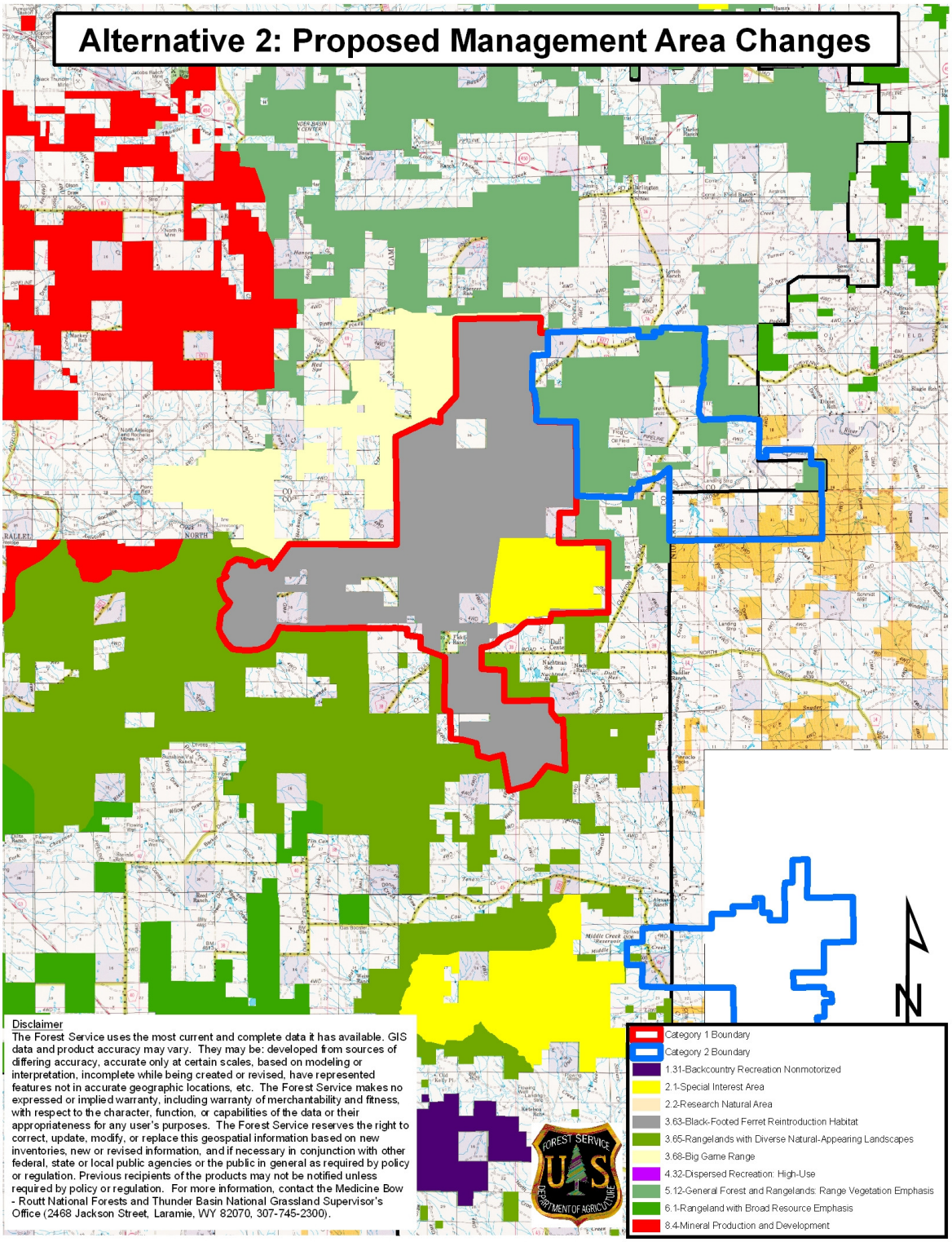
Figure 5: Proposed Action-Black-footed Ferret Habitat Size and Configuration and Other Management Areas



Alternative 3

Boundary management

This alternative was developed based on the August 3, 2005 Record of Decision made on the Nebraska National Forest (USFS, 2005) and on scoping comments from the public concerning issues with prairie dog encroachment onto adjacent private lands. This alternative is heavily reliant on the use of rodenticide as a means of resolving issues with prairie dog encroachment on private lands. No Prairie Dog Habitat categories will be established. **This alternative meets part of the purpose and need for addressing concerns about encroachment onto adjacent private lands but does not maintain viable populations of prairie dogs to support black-footed ferret reintroduction or for other associated species.** This alternative will also require reconsultation with USFWS on the LRMP concerning black-footed ferret as it will result in an adverse effect to this species' habitat.

Management activities within MA 3.63 will emphasize enhancement of prairie dog habitat to provide the largest population possible in the area greater than ½ mile from private land boundaries within MA 3.63.

Under Alternative 3:

- The proposed Prairie Dog Management Strategy (Appendix A) would not be adopted and implemented.
- Emphasis for prairie dog management across the TBNG would be on the use of rodenticides. Prairie dog colonies within ½ mile of private land/TBNG boundaries, including those occurring inside MA 3.63, would be controlled using various lethal and non-lethal methods. Site-specific implementation of rodenticide use will be made using the decision screen as found in Appendix B3.
- Livestock grazing on the TBNG would be managed to provide areas of high structure grassland along private land boundaries to deter remaining prairie dog populations from migrating from the TBNG to private lands. This would likely result in reductions of livestock numbers to maintain high structure in a large area.
- All prairie dog management tools continue to be available.
- Within MA 3.63 the following would be emphasized:
    - Land exchange opportunities will be actively sought and heavily emphasized to reduce areas of conflict with adjoining private land.
    - Plague management dusting will be used heavily within MA 3.63 to reduce plague impacts on the remaining population.
    - Prescribed burning will be used heavily within MA 3.63 to enhance habitat and keep prairie dogs within the MA to the extent possible.
    - Translocation will be used to enhance populations within MA 3.63 whenever feasible.

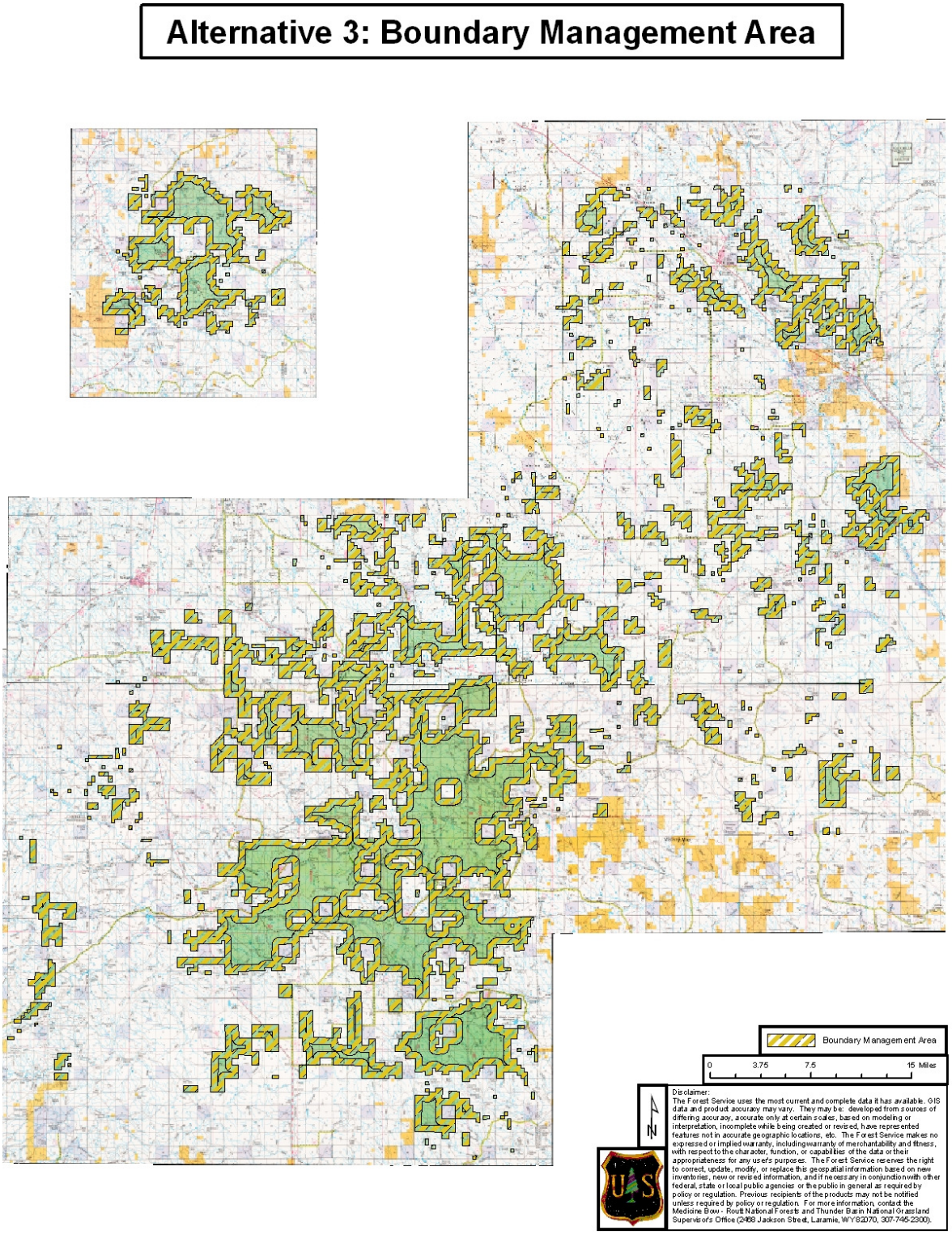
Land and Resource Management Plan Amendment

The following table identifies current LRMP direction that is proposed to be deleted (left column) under this action. This current direction will be revised, replaced in whole, or have no replacement direction (right column) All of the changes identified in Alternative 2 (Proposed Action) would be included in this alternative with the following exception:

Table 2: LRMP Amendment, Changes from current direction under Alternative 3.

Item #	Delete:	Revise or Replace With:
#1	**Chapter 1, F-21**. Any net loss of suitable black-footed ferret habitat as a result of prairie dog poisoning or development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the poisoning or development. **Standard**	**Chapter 1, F-21 (revised)**. Any net loss of suitable black-footed ferret habitat as a result of development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the development. **Standard**
#2	**Chapter 1, H-1.** 1. Prohibit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. **Standard**	**Chapter 1, H-1 (revised).** 1. Limit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. ▪ Colonies within 1/2 mile of private land/TBNG boundaries where encroachment onto neighboring lands is demonstrated. **Standard**
#3	**Chapter 3, Management Area 3.63, General – 1**. Authorize only those uses and activities that do not reduce the suitability of the area as black-footed ferret reintroduction habitat. **Standard**	Standard removed with no replacement

Figure 6: Boundary Management-TBNG lands within 1/2 mile of private lands.



Alternative 4 (Environmentally Preferred)

Adjusted Management Area and Limited Rodenticide Use

Many comments from the public suggested possible limitations or modifications to the proposed action, and this alternative was developed to address these specific suggestions. This alternative allows for some potential use of rodenticides but ensures the continued growth of the prairie dog population. Based upon an average annual growth in occupied prairie dog habitat of 10% on the TBNG from 2002-2008, this alternative restricts rodenticide use to a maximum of 5% of the occupied colony acres per year in areas where unwanted colonization is occurring. If the annual occupied colony growth rate is negative, rodenticide use would be unavailable for that year. The decision screens in Appendix B4 would be used to determine the site specific use of rodenticide. This alternative will be highly reliant on non-lethal methods of control. It will emphasize prescribed burning, translocation and land exchanges as prairie dog management methods. This alternative meets the purpose and need. It also addresses those comments from the public that the additional lands acquired in land exchange should be added to the MA 3.63 without changing the configuration of the area on the north and west sides of the current MA 3.63.

Under Alternative 4, the stated purpose and need would be met through the following:

- The proposed Prairie Dog Management Strategy (Appendix A) would be adopted and implemented with the following modifications:
    - The use of rodenticides on an annual basis is limited to not more than 5% of the active prairie dog colony acres and only if prairie dog colonies have grown to meet or exceed the previous year's inventory (by acres) and adds the following direction. Site specific implementation of the use of the management tools will be made following the Decision Screens as found in Appendix B4.
- All colonies
    - Except for reasons of health and public safety, use of rodenticides is unavailable anywhere on the TBNG until the total acres of active prairie dog colonies exceed 10,000 acres in Category 1 (MA 3.63).
    - Except for reasons of health and public safety, use of rodenticides is unavailable in first year after decision in order to implement appropriate proactive measures to reduce or eliminate conflicts surrounding prairie dog expansion with adjacent non-federal land owners.
    - All prairie dog colony acres controlled through the use of rodenticides will be deferred from livestock grazing to allow for the development of high vegetation structure and adequate visual barriers.
    - Use of rodenticides will be:
        - available to protect public health and safety and existing facilities.
        - unavailable to control prairie dog population densities.
        - unavailable for other situations.

- **Category 1 Habitat**
    - Use of rodenticides:

        - available within ¼ mile of adjacent non-federal lands, only after the acreage of active prairie dog colonies exceeds 18,000 acres within Category 1 (MA 2.1 and MA 3.63).
    - Prairie dog shooting prohibitions
        - Shooting prohibited in the enlarged Category 1 area (MA 3.63).

- **Category 2**
    - Use of rodenticides:
        - available within ¼ mile of non-participating adjacent non-federal lands
    - Prairie dog shooting prohibitions
        - Prairie dog shooting prohibited on NFS acres.
        - Private lands open to shooting as determined by the landowner and the USFWS as documented in a CCAA

- **Categories 3, 4 and Other Prairie Dog Colonies**
    - Use of rodenticides:
        - available for problem colonies within ¼ mile of adjacent non-federal lands
    - Prairie dog shooting prohibitions
        - Prairie dog shooting allowed only on those colonies identified for lethal control

- All prairie dog management tools are available, with emphasis given to the following:
    - Implementing alternative livestock grazing strategies within ½ mile of adjacent non-federal lands that encourage higher vegetation structure and create a visual barrier to prairie dog colonization.
    - Supporting conservation easements that provide for occupied prairie dog habitat on adjacent or nearby non-federal lands.
    - Actively translocating prairie dogs from within the TBNG that potentially will expand onto adjacent non-federal land, to suitable, unoccupied prairie dog habitat within the Black-footed Ferret Reintroduction Habitat.
    - Pursuing Land exchanges or purchases that help to block up contiguous prairie dog habitat within or adjacent to the MA 3.63 Black-footed Ferret Reintroduction Habitat.
    - Prescribed burning to enhance prairie dog habitat and encourage prairie dog colony expansion.
- The boundary of Black-footed Ferret Reintroduction Habitat (MA 3.63) would be modified from the current plan to include additional lands acquired in land exchange as described in the proposed action. The remaining portion of the boundary would remain the same as Alternative 1-No Action.
- Amend the LRMP to support the Black-tailed Prairie Dog Conservation Assessment and Strategy for the TBNG (Appendix A, as modified by this alternative).

- Incorporate additional shooting restriction areas to all prairie dog colonies on NFS lands except those that are scheduled for lethal control.
- The Forest Service would enter into a Candidate Conservation Agreement (CCA) with the USFWS to document Forest Service actions that would be undertaken to reduce or remove threats to the black-tailed prairie dog and associated species.

Figure 7 and Figure 8 show the current and historical extent of prairie dog colonies and their categorical designations for Alternative 4.

Figure 7: Alternative 4-Current Extent of Prairie Dog Colonies by Category

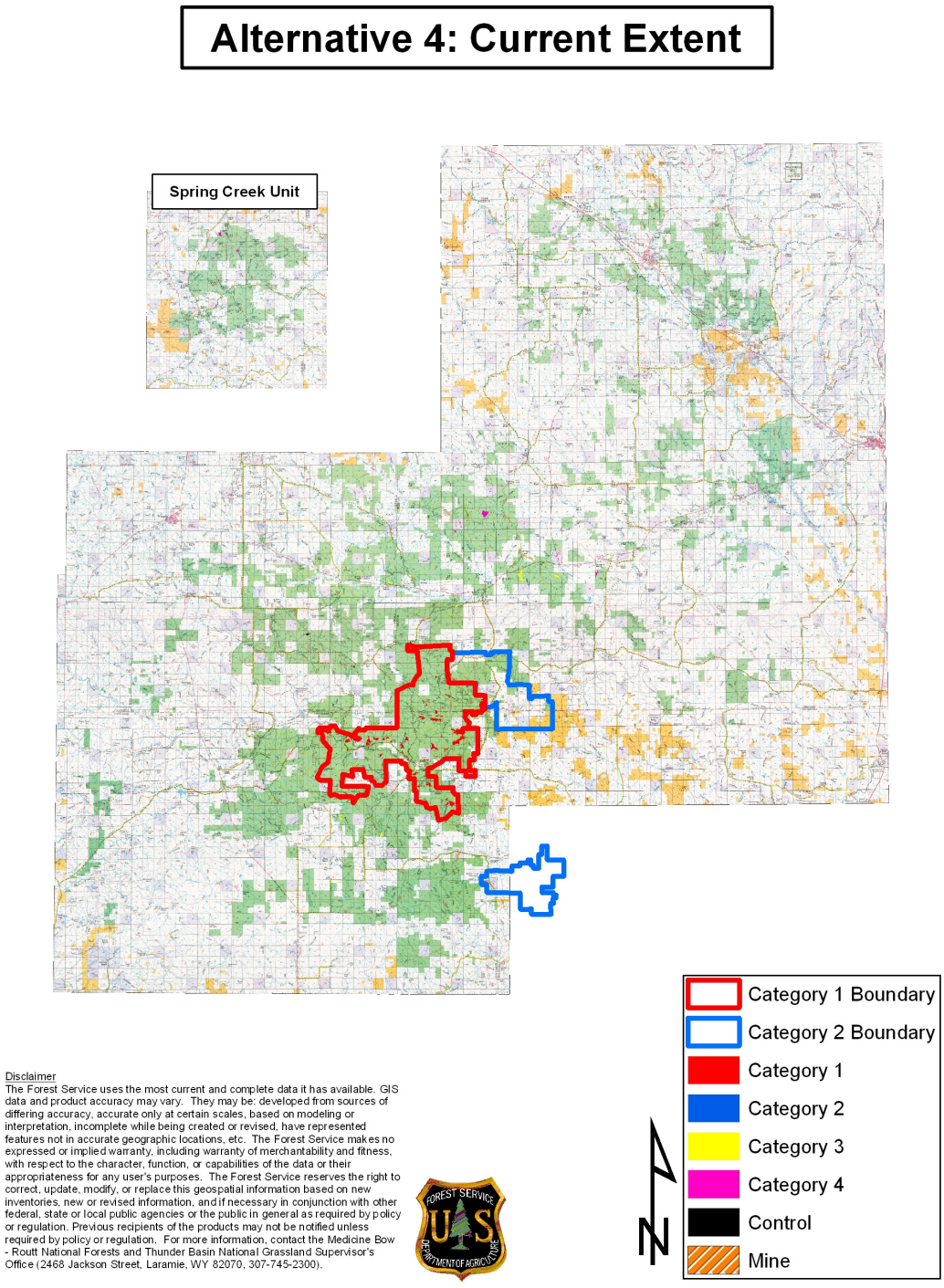
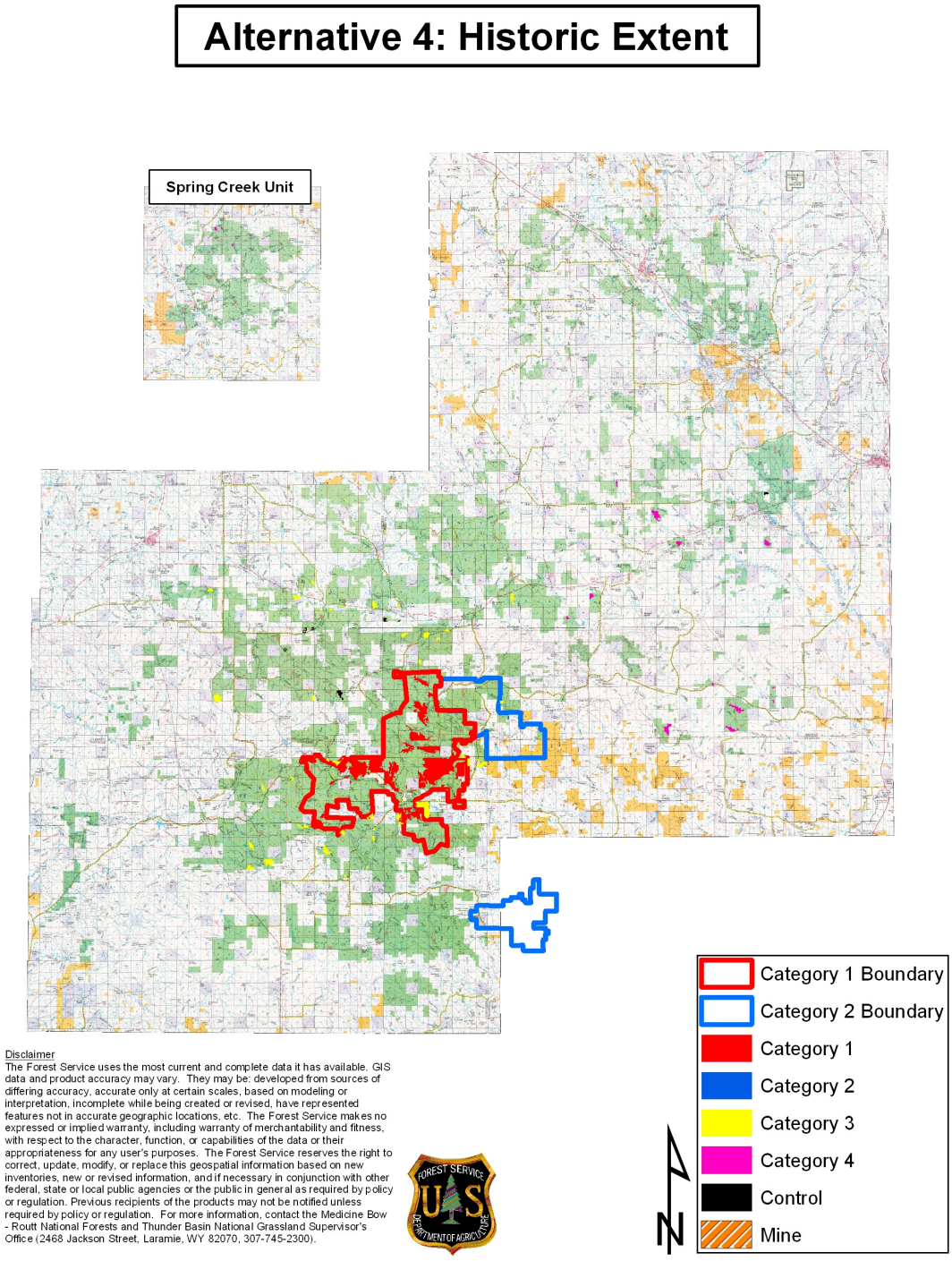


Figure 8: Alternative 4-Historical Extent of Prairie Dog Colonies by Category



Land and Resource Management Plan Amendment

The following table identifies current LRMP direction that is proposed to be deleted (left column) under this action. This current direction will be revised, replaced in whole, or have no replacement direction (right column) All of the changes identified in Alternative 2 (Proposed Action) would be included in this alternative with the following exception:

Table 3: LRMP Amendment, changes from current direction under Alternative 4.

Item #	Delete:	Revise or Replace With:
#1	**Chapter 1, F-21**. Any net loss of suitable black-footed ferret habitat as a result of prairie dog poisoning or development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the poisoning or development. **Standard**	**Chapter 1, F-21(revised)**. Any net loss of suitable black-footed ferret habitat as a result of development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the development. **Standard**
#2	**Chapter 1, H-1.** 1. Prohibit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. **Standard**	**Chapter 1, H-1 (revised).** 1. Limit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. ▪ Within 1/4 mile of the boundary with neighboring private lands when prairie dog colonies are expanding on to neighboring private lands where they are not wanted. ▪ Rodenticide may be applied on no more than 5% of the existing active colony acreage, provided that active colony acreage is the same or higher than in the previous year. ▪ Rodenticide may not be applied anywhere on the TBNG until there are 10,000 acres of active colonies within the MA 3.63. **Standard**
#3	**Chapter 1, H-2**. Consult state-wide prairie dog conservation strategies for additional guidance on the appropriate response to complaints of unwanted prairie dog colonization on adjoining agricultural lands (private, state, and tribal lands). **Guideline**	**Chapter 1, H-2 (revised)**. In Consultation with the Wyoming Game and Fish Department, determine the appropriate response to complaints of unwanted colonization on adjoining private and state lands. A spectrum of management tools will be considered based on site-specific evaluations. **Guideline**

<table>
<tr><th>Item #</th><th>Delete:</th><th>Revise or Replace With:</th></tr>
<tr><td>#4</td><td>Chapter 2, Broken Hills Geographic Area Management Area Prescription Allocation
<table>
<tr><th>Number</th><th>Prescription</th><th>Acres</th></tr>
<tr><td>1.31</td><td>Backcountry Recreation Nonmotorized</td><td>6,545</td></tr>
<tr><td>2.1</td><td>Special Interest Area</td><td>14,170</td></tr>
<tr><td>3.63</td><td>Black-footed Ferret Reintroduction Habitat</td><td>13,619</td></tr>
<tr><td>3.65</td><td>Rangelands with Diverse Natural-Appearing Landscapes</td><td>71,100</td></tr>
<tr><td>3.68</td><td>Big Game Range</td><td>18,426</td></tr>
<tr><td>5.12</td><td>General Forest and Rangeland</td><td>33,577</td></tr>
</table>
As shown on the map for the LRMP, which is a part of the LRMP</td><td>Chapter 2, Broken Hills Geographic Area Management Area Prescription Allocation
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<tr><td>3.63</td><td>Black-footed Ferret Reintroduction Habitat</td><td>22,561</td></tr>
<tr><td>3.65</td><td>Rangelands with Diverse Natural-Appearing Landscapes</td><td>62,158</td></tr>
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<tr><td>5.12</td><td>General Forest and Rangeland</td><td>33,577</td></tr>
</table>
As shown on Appendix C-map</td></tr>
<tr><td>#5</td><td>Chapter 2, Cellers Rosecrans Geographic Area Management Area Prescription Allocation
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<tr><th>Number</th><th>Prescription</th><th>Acres</th></tr>
<tr><td>2.1</td><td>Special Interest Area</td><td>6,940</td></tr>
<tr><td>2.2</td><td>Research Natural Areas</td><td>1,213</td></tr>
<tr><td>3.63</td><td>Black-footed Ferret Reintroduction Habitat</td><td>34,275</td></tr>
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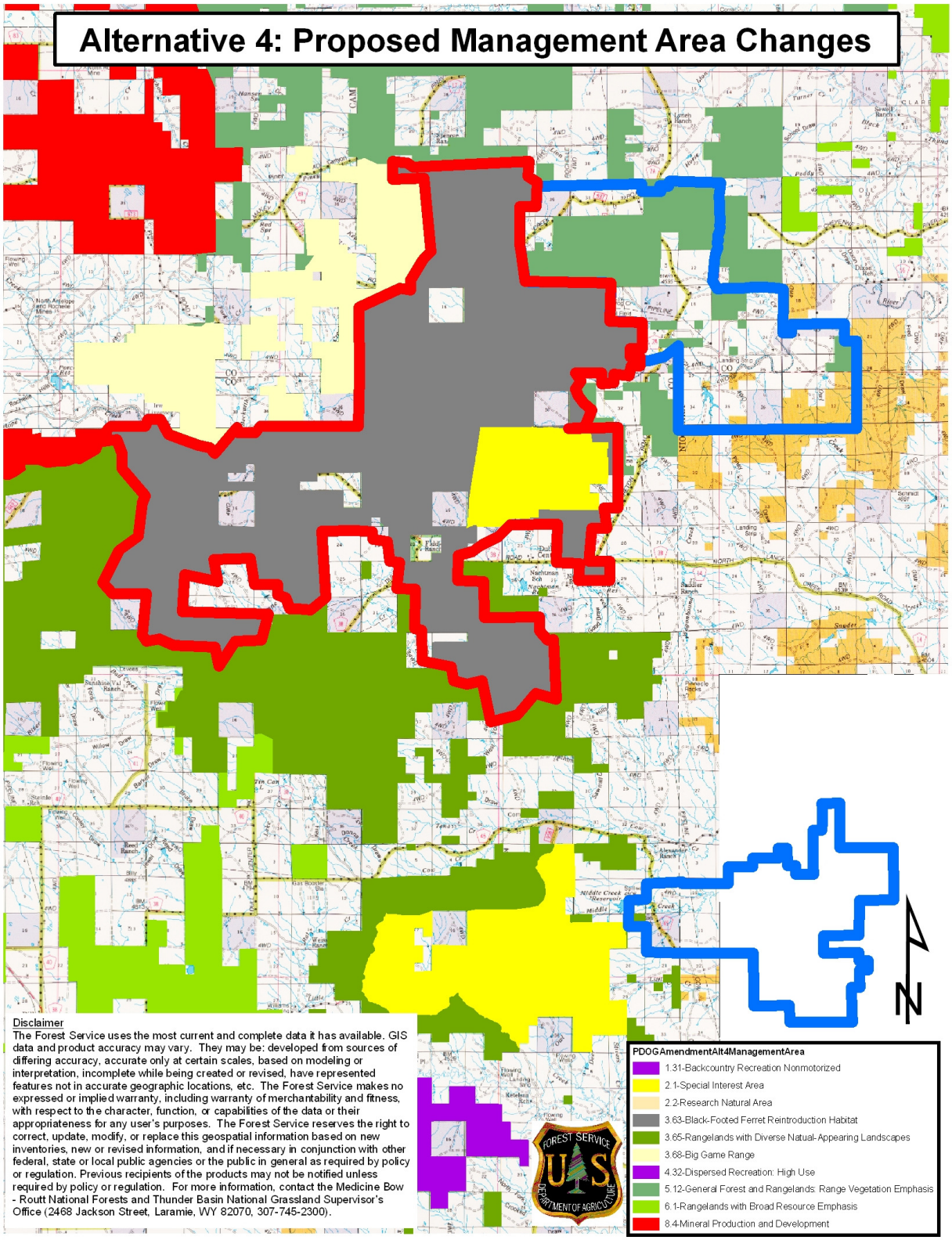
<tr><td>5.12</td><td>General Forest and Rangeland</td><td>78,068</td></tr>
</table>
As shown on Appendix C Map</td></tr>
<tr><td>#6</td><td>Chapter 3, Management Area 3.63, General – 1. Authorize only those uses and activities that do not reduce the suitability of the area as black-footed ferret reintroduction habitat. Standard</td><td>Chapter 3, Management Area 3.63, General – 1 (revised). Authorize only those uses and activities in the reintroduction area that do not reduce habitat below the level needed to support a long-term sustainable black-footed ferret population.

Until habitat is available to support a long-term sustainable black-footed ferret population, do not authorize uses and activities that would prevent increases in the prairie dog population. Standard</td></tr>
</table>

Figure 9: Adjusted Management Area and Limited Rodenticide Use



Alternative 5 (Preferred)

Additional Category 2 Areas

This alternative was developed based on public comments that additional Category 2 management areas beyond those identified in Alternative 2 should be identified and managed on the TBNG. This alternative meets the purpose and need.

Under Alternative 5:

- The proposed Prairie Dog Management Strategy (Appendix A) would be adopted and implemented with the following modifications:
    - The site-specific strategy would be modified to include three additional Category 2 areas. These additional areas are known as North 450, South Cellers and Piney Creek.
    - Prairie Dog shooting would be prohibited on all NFS lands within one Category 1 area and five Category 2 areas.
- The boundary of Black-footed Ferret Reintroduction Habitat (MA 3.63) would be modified as described in Alternative 2-Proposed Action.
- Objective of a total of 9,000 acres of occupied prairie dog habitat on NFS and private lands within the five Category 2 areas.
- All prairie dog management tools are available, with emphasis given to the following:
    - Implementing alternative livestock grazing strategies within ½ mile of adjacent non-federal lands that encourage higher vegetation structure and create a visual barrier to prairie dog colonization.
    - Encouraging conservation agreements that provide for occupied prairie dog habitat on adjacent or nearby non-federal lands.
    - Using approved rodenticides on prairie dog colonies under site-specific conditions/situations as outlined in the prairie dog management strategy (Appendix A), following the Decision Screens as described in Appendix B2.
- The Forest Service would enter into a Candidate Conservation Agreement (CCA) with the USFWS to document Forest Service actions that would be undertaken to reduce or remove threats to the black-tailed prairie dog and associated species.

Figure 10 and Figure 11 show the current and historical extent of prairie dog colonies and their categorical designations for Alternative 5.

Figure 10: Alternative 5-Current Extent of Prairie Dog Colonies by Category

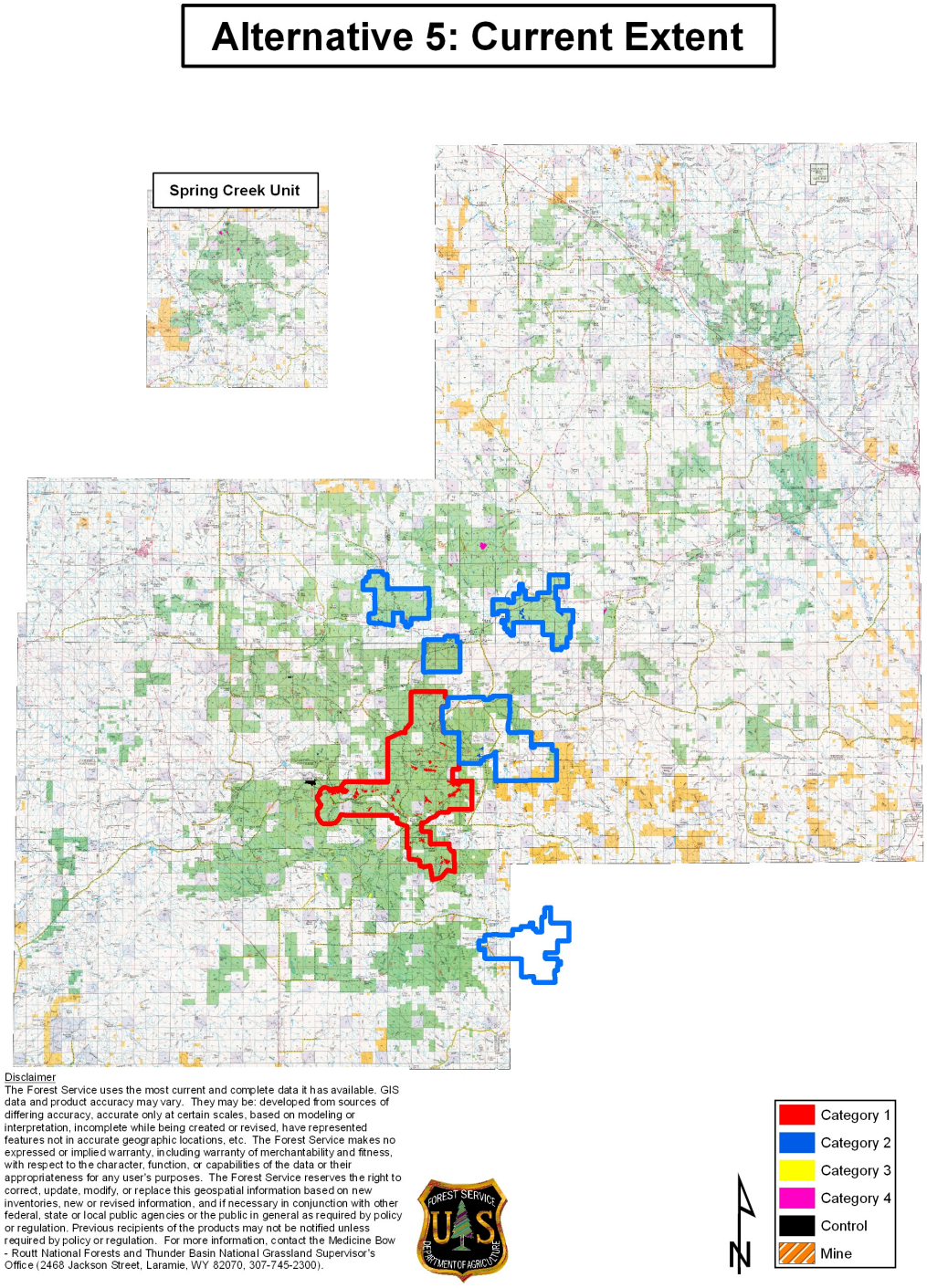
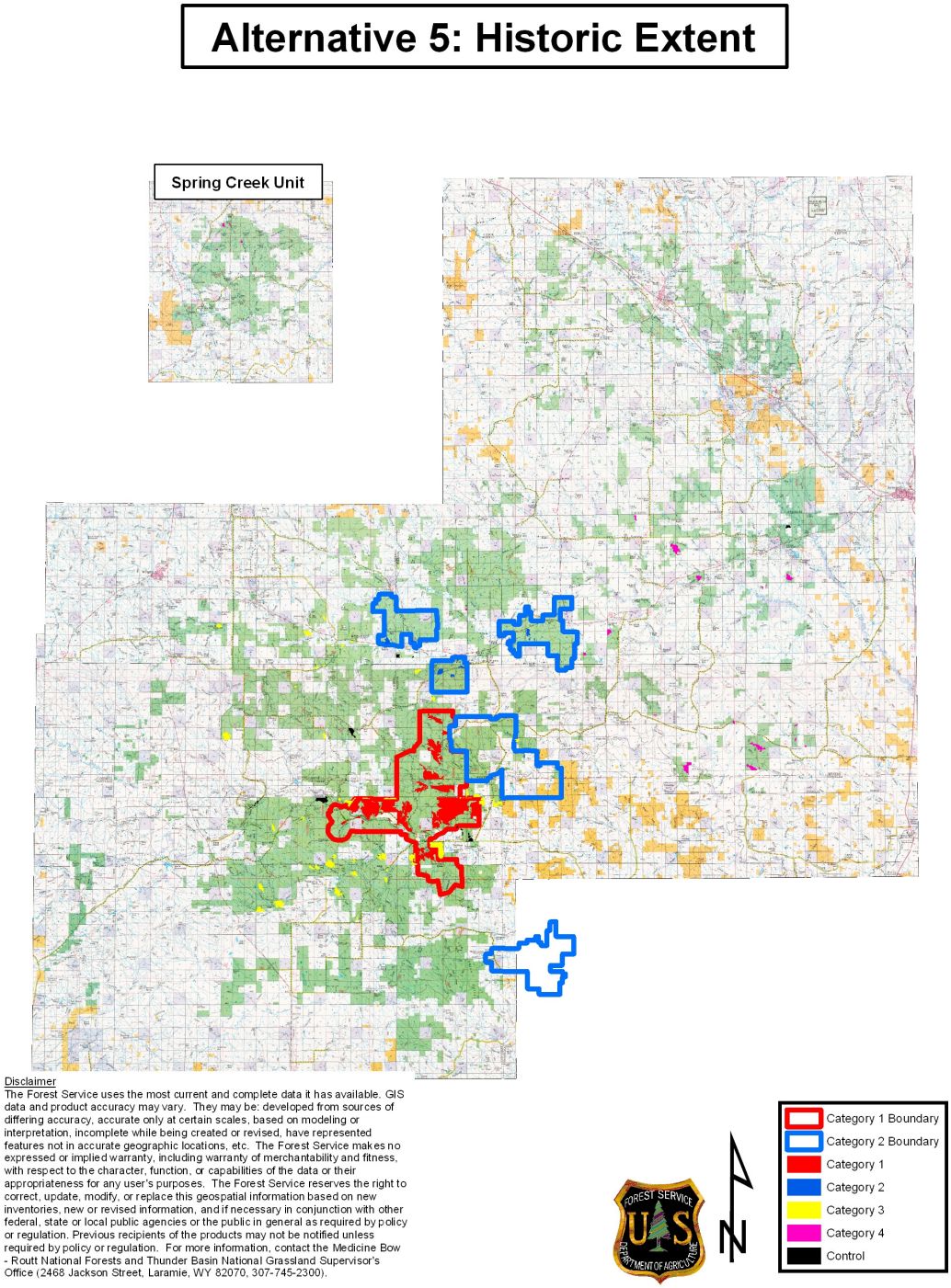


Figure 11: Alternative 5-Historical Extent of Prairie Dog Colonies by Category



Land and Resource Management Plan Amendment

The following table identifies current LRMP direction that is proposed to be deleted (left column) under this action. This current direction will be revised, replaced in whole, or have no replacement direction (right column) All of the changes identified in Alternative 2 (Proposed Action) would be included in this alternative with the following exception:

Table 4: LRMP Amendment, changes from current direction under Alternative 5.

Item #	Delete:	Revise or Replace With:
#1	**Chapter 1, F-21**. Any net loss of suitable black-footed ferret habitat as a result of prairie dog poisoning or development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the poisoning or development. **Standard**	**Chapter 1, F-21 (revised)**. Any net loss of suitable black-footed ferret habitat as a result of development of new facilities within colonies shall be replaced within the year. This is based on the amount of suitable habitat available prior to prairie dog dispersal in the year of the development. **Standard**
#2	**Chapter 1, H-1.** 1. Prohibit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. **Standard**	**Chapter 1, H-1 (revised).** 1. Limit the use of rodenticides (grain baits) for reducing prairie dog populations to the following situations: ▪ Public health and safety risks occur in the immediate area, ▪ Damage to private and public facilities, such as cemeteries and residences. ▪ On prairie dog colonies that are expanding on to neighboring private lands where they are not wanted. ▪ Colonies outside Categories 1, 2, 3, and 4 (as identified in strategy) if the Forest Service determines they are not needed for habitat for prairie dogs, black-footed ferrets or other associated species. **Standard**
#3	**Chapter 1, H-2**. Consult state-wide prairie dog conservation strategies for additional guidance on the appropriate response to complaints of unwanted prairie dog colonization on adjoining agricultural lands (private, state, and tribal lands). **Guideline**	**Chapter 1, H-2 (revised)**. In Consultation with the Wyoming Game and Fish Department, determine the appropriate response to complaints of unwanted colonization on adjoining private and state lands. A spectrum of management tools will be considered based on site-specific evaluations. **Guideline**

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Until habitat is available to support a long-term sustainable black-footed ferret population, do not authorize uses and activities that would prevent annual increases in the prairie dog population. Standard</td></tr>
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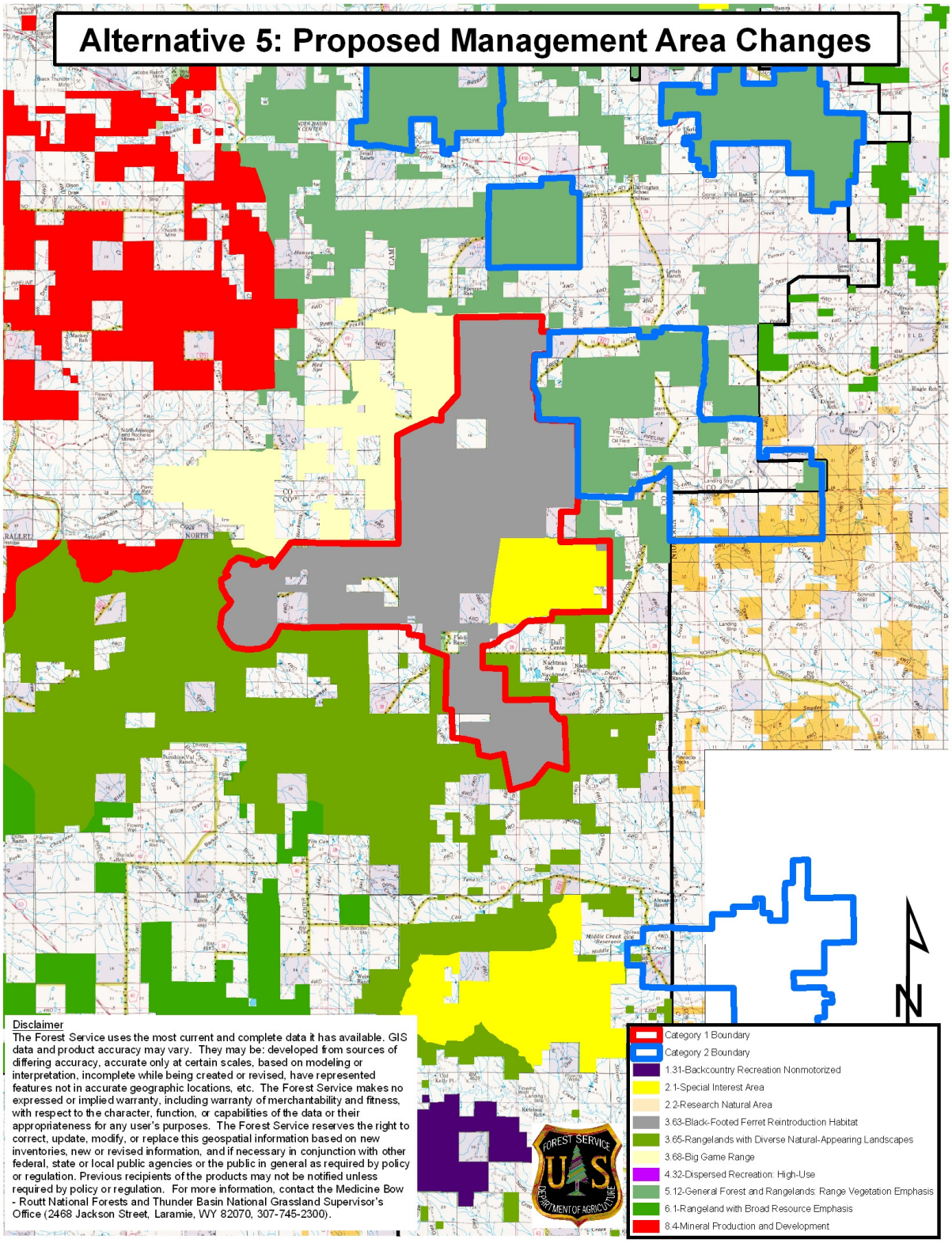
Figure 12: Additional Category 2 Areas



Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the project, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

More Category 1 Areas

It was suggested that it would be desirable to maintain more than one Category 1 area (see Appendix A) for better overall management of prairie dogs and associated species. This possible alternative was dropped from further consideration because there is not another area in public ownership on the TBNG large enough to support a population of prairie dogs to meet the goals of this category, nor has there historically been another prairie dog complex on TBNG to meet these goals. Other areas of this type could potentially be supported on other land ownerships within the area; however, a decision to provide this on other ownerships is outside the scope of this proposal.

Ungrazed buffers

The suggestion was made to use ungrazed areas as buffers to reduce the need for lethal management tools and reduce unwanted colonization onto private lands. This suggestion was dropped from further consideration because that method is a tool that can be used as part of any of the alternatives.

Only Maintaining Prairie Dogs in Category 1 and 2

It was suggested that prairie dogs should only be maintained in the proposed Category 1 and 2 areas and colonies outside of these areas should be controlled or eliminated. This possible alternative was eliminated from further study because it is not consistent with requirements to maintain viability of management indicator species over the entire planning unit and could impact viability of prairie dogs and associated sensitive species.

Prairie Dog Management as prescribed in the 1985 Medicine Bow National Forest Land and Resource Management Plan and in the 1960's

It was suggested that prairie dogs should be managed at the levels as prescribed in the 1985 Medicine Bow National Forest Land and Resource Management Plan. This possible alternative was eliminated from further study because it is not consistent with the goals and objectives established in the current LRMP, or with NEPA and NFMA requirements to utilize the best available information.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the following tables is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. A more detailed comparison of the alternatives can be found in Appendix E.

Summary of Expected Use

Table 5 provides information on the estimated use of the various prairie dog management tools described in the Black-tailed Prairie Dog Conservation Assessment and Strategy. The numbers shown in this table do not necessarily represent a minimum, maximum or target amount expected to be accomplished on a yearly basis; but rather identify a range of annual amounts based upon the intent of each of the alternatives being analyzed.

The acres of chemical control provided in Table 5 represent the low and high amounts of rodenticide use considered for use in a given year under each alternative. These acreage figures are primarily associated with the same prairie dog colonies and represent retreatment applications to those colonies in ensuing years. Retreatment of prairie dog colonies generally occurs on an every 2-3 year basis.

The low acreage amount represents the acres of the colonies identified for control that are currently occupied by prairie dogs. The high amount represents the acres projected for potential treatment of those same prairie dog colonies based upon their greatest extent (2001). Additional information on how these amounts were derived can be found in the Biological Assessment/Biological Evaluation (in the project record).

Table 5. Estimated Management Tool Use by Alternative

Management Tools	Estimated Amount of Expected Use by Alternative (2010-2020)				
	Alternative 1 No Action	**Alternative 2 Proposed Action**	**Alternative 3 Boundary Management**	**Alternative 4 Adjusted Boundary and Limited Rodenticide**	**Alternative 5 Additional Category 2s**
		Range (Acres)	**Range (Acres)**	**Range (Acres)**	**Range (Acres)**
Chemical Control(Category 1 or 3.63)	0 acres	0	300-4500	0	0
Chemical Control (Category 2)	0 acres	0	NA	0	0
Chemical Control (Category 3/4)	0 acres	0	NA	0	0
Chemical Control (Other)	0 acres	398-1097	343-4300	200-1073	398-1097
Conservation Agreements	none	CCAA and CCA	none	CCA	CCAA and CCA
Conservation Easements	as opportunities arise	as opportunities arise	as opportunities arise	as opportunities arise	as opportunities arise
Land Exchange or Purchase	Emphasize as opportunities arise	as opportunities arise	Emphasize as opportunities arise	Emphasize as opportunities arise	as opportunities arise
Predator Enhancement	5 structures	5 structures	5 structures	5 structures	5 structures
Prescribed Burning	1500-2500 acres annual avg	1000-1500 acres annual avg	1500-2200 acres annual avg	2500-3500 acres annual avg	1500-2000 acres annual avg
Prescribed Grazing along Boundary	35 miles	25 miles	100+ miles	38 miles	81 miles
Recreational Shooting (Category 1)	prohibited	prohibited	prohibited	prohibited	prohibited
Recreational Shooting (Category 2)	allowed outside MA 3.63	prohibited on NFS	allowed outside MA 3.63	prohibited on NFS	prohibited on NFS
Recreational Shooting (Category 3/4)	allowed outside MA 3.63	allowed	allowed outside MA 3.63	prohibited on NFS	Allowed
Recreational Shooting (Other)	allowed	allowed	allowed	Allowed only on colonies identified for lethal control	Allowed
Translocation[A]	300-400 acres	200-300 acres	300-400 acres	300-400 acres	200-300 acres
Visual Barriers along Boundary[B]	10 miles	3 miles	10 miles	7 miles	5 miles
Pesticide (Dusting)[C]	0-2000 acres/year	0-2000 acres/year	1500-2000 acres/year	0-2000 acres/year	0-2000 acres/year

[A] Translocation estimates only-Wyoming Game and Fish must approve all translocations within the state
[B] Estimates based on colonies historical high populations and colonies with likely conflicts and tools as emphasized by alternative
[C] Pesticide (Dusting)-range of acres only, actual acres are dependent on colony densities, plague, and colony size

Summary of Expected Impacts

Table 6 and Table 7 provide a summary of expected impacts by resource area and issues as identified through public comments.

Table 6: Comparison of Alternatives by Resource Area

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wildlife	TE-No effect[A] Sensitive-No impact MIS-No loss of viability Other-No effect	TE-No effect[A] Sensitive-May impact individuals, MIS-No loss of viability Other-No effect	TE-No effect[A] Sensitive-Trend toward federal listing MIS- loss of viability Other-negative impact	TE-No effect[A] Sensitive-May impact individuals, MIS-No loss of viability Other-No effect	TE-No effect[A] Sensitive-May impact individuals, MIS-No loss of viability Other-No effect
Botany	TE-No Effect Sensitive-May impact individuals Other-May impact individuals-no loss of viability	TE-No Effect Sensitive-May impact individuals Other-May impact individuals-no loss of viability	TE-No Effect Sensitive-May impact individuals Other-May impact individuals-no loss of viability	TE-No Effect Sensitive-May impact individuals Other-May impact individuals-no loss of viability	TE-No Effect Sensitive-May impact individuals Other-May impact individuals-no loss of viability
Vegetation	Long term shift to more area in early seral stage	Long term maintain mix of early, mid and late seral stages	Long term shift to more late seral stages	Long term maintain mix of late and mid seral stages	Long term maintain mix of late and mid seral stages
Economic	Implementation costs over 10 yrs (PNV) -$2,735,295	Implementation Costs over 10 yrs (PNV) -$2,449,861	Implementation Costs over 10 yrs (PNV) -$4,205,438	Implementation Costs over 10 yrs (PNV) -$3,936,188	Implementation Costs over 10 yrs (PNV) -$2,769,273
Minerals	30 existing Leases in MA 3.63, 2 with BFF stips, 55,020 acres subject to BFF stips	22 existing Leases in MA 3.63, 2 with BFF stips, 55,386 acres subject to BFF stips	30 existing Leases in MA 3.63, 2 with BFF stips, 55,020 acres subject to BFF stips	32 existing Leases in MA 3.63, 2 with BFF stips, 64,541 acres subject to BFF stips	22 existing Leases in MA 3.63, 2 with BFF stips, 55,386 acres subject to BFF stips

[A] No effect-No T&E species are currently present in potential project areas.

Table 7: Comparison of Alternatives by Issue

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Soil erosion[A]	Increasing soil erosion as prairie dog colonies expand	Soil erosion reduced in areas where prairie dog colonies are controlled	Least amount of soil erosion, with almost no large prairie dog colonies	Soil erosion reduced in areas where prairie dog colonies are controlled	Soil erosion reduced in areas where prairie dog colonies are controlled
Rodenticide Use direction	Only for human health and safety and damage to facilities	For human health and safety, damage to facilities, and to reduce unwanted colonization per strategy	Can be used within ½ mile of all grasslands/private lands boundaries to reduce unwanted colonization	For human health and safety, damage to facilities, and to reduce unwanted colonization per strategy-limited to 5%	For human health and safety, damage to facilities, and to reduce unwanted colonization per strategy
Expansion of Prairie dog colonies onto private lands	Expansion potential unchanged, because the most effective tool (rodenticide) is not available for this purpose	Limits expansion of colonies onto private lands and promotes landscape level management of prairie dogs	Manages boundaries to severely limit colony expansion onto private lands	Limits expansion of colonies onto private ands and promotes landscape level management of prairie dogs	Limits expansion of colonies onto private ands and promotes landscape level management of prairie dogs
Loss of forage for permitted livestock	No change from existing conditions	Potentially some increase in forage available although some forage to be left for visual barriers	Short term loss until high structure is established in buffer areas that are fenced out (3-10 years) Long term increase	Potentially some increase in forage available although some forage to be left for visual barriers	Potentially some increase in forage available although some forage to be left for visual barriers
Long Term Effects to Prairie Dog Conservation, Ferret Recovery, and other Associated species	Does not gain public support for ferret recovery and prairie dog conservation but provides for viability and conservation of species.	Helps to gain local public support for prairie dog conservation and black-footed ferret recovery on the TBNG, which would facilitate a future reintroduction while still maintaining for viability and conservation of species.	Does not provide for viability and conservation of species.	Helps to gain local public support for prairie dog conservation and black-footed ferret recovery on the TBNG, which would facilitate a future reintroduction while still maintaining for viability and conservation of species.	Helps to gain local public support for prairie dog conservation and black-footed ferret recovery on the TBNG, which would facilitate a future reintroduction while still maintaining for viability and conservation of species.

[A] depends on soil type and slope of prairie dog colony acres treated

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This Chapter summarizes the physical, biological, social, and economic environments of the project area and the effects of implementing each alternative on those environments. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

Prairie Dog Management Tools:

A variety of tools are available under each alternative for managing prairie dog colonies and habitat conditions on the TBNG. A complete discussion of each management tool can be found in the Black-tailed Prairie Dog Conservation Assessment and Management Strategy (Appendix A). A comparison of the expected use of each tool by alternative can be found in Table 5 and a more detailed comparison can be found in Appendix E. Table 8 summarizes the cost and effectiveness of each of the tools.

Table 8: Comparison of Effectiveness of Management Tools

Management Tool	Effectiveness	Cost	Rationale
Plague Management (Dusting)	moderate	$27.90/ acre	Repeated dusting of burrows with pesticides is labor intensive, expensive, and not practical for large colonies and complexes (2). It can be effective at reducing populations of the plague vector and other flea species for at least 84 days (3). Cost of dusting in Conata Basin is running approximately $27.90 per acre (R. Griebel, USFS, pers. comm. 2009)
Predator Enhancement	low	$500/ platform	Adding perches for predatory birds is a method that does not work well, and is impractical and expensive for the elimination or reduction of prairie dogs (10). Perches already constructed in prairie dog colonies on TBNG are not being utilized by raptors.
Prescribed burning	moderate (average 40%)	$37/acre	Burning can be used to increase colony expansion rates. Expansion rates on to burned areas range from 38-42% (14). Can be used to restore historic disturbance regimes. Later winter burns in moderately grazed areas do not negatively effect herbaceous production (16), which means burning can positively effect prairie dog management and grazing management. Average cost per acre to burn is $37/acre (Westbrook, 2009, Pers. Communication).
Prescribed Grazing (Vegetative Barrier)	high	No cost to FS	Use of vegetative buffer strips are effective in limiting prairie dog town expansion (6). Effectiveness is dependent on visual obstruction and vegetation height; need at least 40cm height and Visual Obstruction Reading (VOR) of 10cm to minimize breakthrough (6). When conditions allow for a 40cm vegetation height and 10cm VOR, a 40m buffer strip is likely adequate at reducing expansion (15). A predicted buffer width necessary for zero breakthroughs ranged from 85.1 m to 103.1 m with means ranging from 91.3 m (15). Drought and rainfall are two factors that can influence effectiveness of vegetative barriers (15).

Management Tool	Effectiveness	Cost	Rationale
Prescribed Grazing	high	No cost to FS	Cost effective and can be done on large scale. Can reduce population growth rates of prairie dogs on areas deferred from grazing (7). It may also be an effective tool in reducing re-colonization after treatment from rodenticide (7), so that future rodenticide use may not be needed. Livestock grazing can be modified through different techniques to create mosaics of vegetation and increase structural diversity, and reduce conflict between conservation and livestock production (8).
Recreational Shooting	moderate (average 52%)	No cost to FS	Can be effective on small scale, but not practical or cost effective as dogs often become gun-shy(12). Has potential to limit rather than eliminate populations (13). May limit local food supply for large predators like coyotes, which could increase chance of predation of livestock (10). Has a population density reduction success rate of 35-69% (12, 13, 19). Shooting can dramatically alter behavior of prairie dogs that have survived plague, reducing body condition, which reduces reproduction and prevents quick recovery (17). Shot prairie dogs could make lead accessible to predators and scavengers, and potential poison them (18). Need to consider using non-expanding lead bullets to reduce likelihood of lead consumption by non-target species (18).
Rodenticide Use (Chemical Control)	high (average 80%)	$10/acre	Have population density reduction success rates of 75-85%(12, 20), are relatively inexpensive, with a cost of about $10/acre (20). Effects of one-time or infrequent use are usually short lived (10). Not 100%, and prairie dogs survive and reproduce well under conditions of low populations and reduced competition that follow rodenticide use (10). It has the potential to kill other non-target species (10).
Translocation	moderate (average 62%)	$165/dog	Can be expensive, with a range of $30-$300 per dog (average $165 per dog) and time consuming (11). Survival rates range from 30-90%, with city and county officials reporting 30-50%, and private organizations reporting 50-95% (11). Considerations that need to be considered are disease, genetics, trapping, release sites (10). Translocation is more successful if: animals are disease free, going to disease free site; are captured from source site close to release site; high trapping efficiency (rarely do more than 25% of live traps capture dogs); release site has no history of plague (or may have to dust); can capture at least 60-100 dogs, with sex ratio 2(F):1(M) (10). Release sites also do better if they have short vegetation (<12cm tall) and pre-existing burrows (9). Retention baskets of fenced enclosures may be used to reduce dispersal and predation (9). Control of predators may be needed prior to or following release (9). If implementing all of the above considerations, in order to increase chance of survival, cost could be closer to $300 per dog.
Visual Barriers	low	$45/meter (average)	Not practical or economical for large areas. Plastic visual barriers are least effective due to wind damage (11). Vinyl barriers are frequently breached by prairie dogs, but barriers including vegetation were breached less (1). Corrugated metal or fiberglass extending above and below ground are rarely breached, but are twice the cost of vinyl (1). Presence of visual barriers do not hinder prairie dog colony expansion (5), although some are more effective than others. Galvanized roofing costs $60/m and vinyl fence costs $30/m (1).

References used for Table 8 are numbered in the table [ie.(1)] and are cross referenced in Chapter 4.

3.1 Wildlife

3.1.1 Existing Conditions – Black-tailed Prairie Dog and Black-footed Ferret

Black-tailed prairie dog (*Cynomys ludovicianus*):
The black-tailed prairie dog is critically important to the prairie ecosystem. It is a colonial rodent that creates shortgrass environments for a wide variety of prairie species. Prairie dog colonies provide important habitats for many rare species, such as burrowing owls, mountain plovers, swift foxes and others. Prairie dogs are an important prey item for a number of raptors as well as predatory mammals. They are also the key species to the survival of the federally listed endangered black-footed ferret. (Clark and Stromberg, 1987; Hoogland, 2006a)

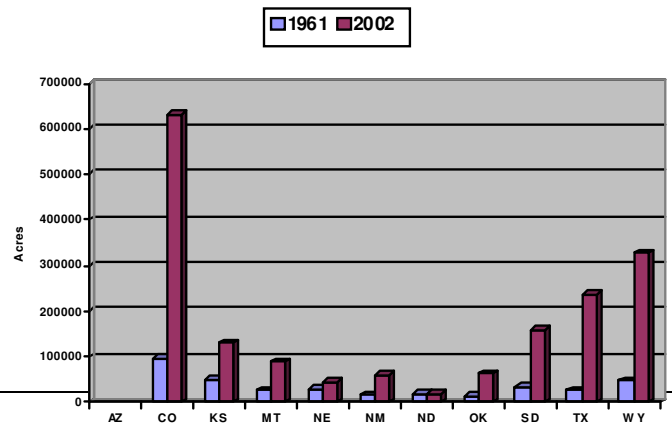
In 1998, the black-tailed prairie dog was listed as a candidate species under the Endangered Species Act. In August of 2004, it was removed as a candidate species, but is still considered sensitive by the USFS, Region 2. In, 2007 another petition was filed for listing under ESA. It is currently undergoing a status review by the USFWS to determine whether or not to list it as threatened under the Endangered Species Act.

The range of the black-tailed prairie dog extends from southern Canada to northern Mexico and from approximately the 98th meridian west to the Rocky Mountains. Occupied habitat is near 95 percent less today than at the turn of the twentieth century. Female black-tailed prairie dogs do not breed until their second year and usually live three to five years. They produce a single litter, usually of four to five pups per year. Migration is ordinarily limited to around three miles. This species is also a common resident in the short- and mid-grass habitats of eastern Wyoming (Clark and Stromberg, 1987).

According to the 2007 Black-tailed prairie dog petition, the USFWS estimated populations nationwide to be around 1,842,000 acres of active prairie dog colonies in 2004, compared to historic populations of 100 million acres. This represents a >98% decline in active prairie dog colony acres from historic estimates (Forest Guardians et al, 2007). Of the 2004 total acres estimated nationwide, The TBNG represents 0.5% of the 2004 nationwide estimate.

The table below was provided by Black-footed Ferret Recovery Implementation Team in 2003. It shows an increase in black-tailed prairie dog populations in all states across the US that has black-tailed prairie dogs or black-tailed prairie dog habitat over the 40-year period. More specific information regarding the data in the table below can be found in the BABE in the project record (BFRIT, 2003).

Figure 13: Estimates of Black-tailed Prairie Dog Occupied Habitat by State



The following table displays the changes in active black-tailed prairie colony acreages over the past 28 years by USFS Unit across the United States.

Table 9: **Acres of Active Black-tailed Prairie Dog Colonies by National Forest System - Range Wide**

	1980	**2002**	**2003**	**2004**	**2008**
Buffalo Gap (SD)	42601	18105		26243	28993[1]
Thunder Basin (WY)	6300	4324	5629	9550	4000
Comanche (CO)	1803	6167	6619	12123	3607
Cimarron (KS)	49	3321	4008	5634	1337
Pawnee (CO)	445	1801	2053	2862	2398
Oglala (NE)	296	1275	-	2246	1350
Ft. Pierre (SD)	939	642	-	1323	2267
Nebraska (NE)	141	64	-	89	90
Black Hills (SD)	-	220	274	274	386
McKelvie (NE)	0	0	0	0	0
Little Missouri (ND)	1359	4151		4151	6928
Grand River (SD)	1507	1786	1509	2020	2407
Custer (MT/SD)	-	538		618	1088
Kiowa/Rita Blanca (NM/TX/OK)	1038	5400	6771	4114	3056
Black Kettle (OK/TX)	0	0	0	0	0
Grand Total	**56478**	**47794**		**71247**	**57907**

[1]During 2008, an additional 10,000 acres of prairie dog colonies succumbed to plague on Buffalo Gap NG.

As of 2008, compared to other NFS Units throughout the country, the active prairie dog colony acreage on the TBNG represents approximately 7% of the USFS prairie dog population. This is based on the table prepared by John Sidle (USFS) and updated by Sidle in 2008.

The WGFD completed a statewide inventory of black-tailed prairie dogs in 2003, and estimated there to be approximately 230,000 acres of active prairie dog colonies. As a part of this inventory, they identified 8 prairie dog complexes larger than 5,000 acres. The largest complex was approximately 100,000 acres in size and encompassed the TBNG. The following map shows those complexes identified by WGFD.

Figure 14: **Current Prairie Dog complexes in Eastern Wyoming**

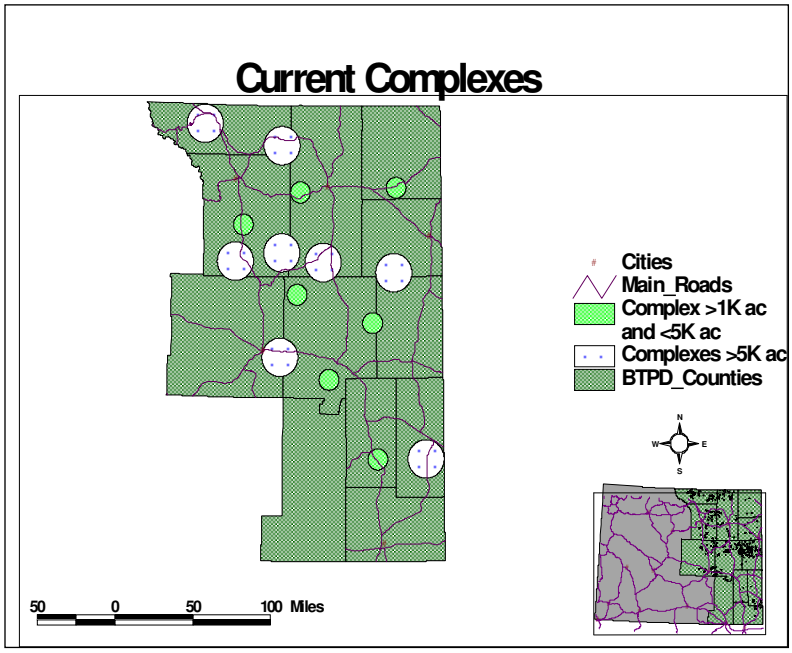
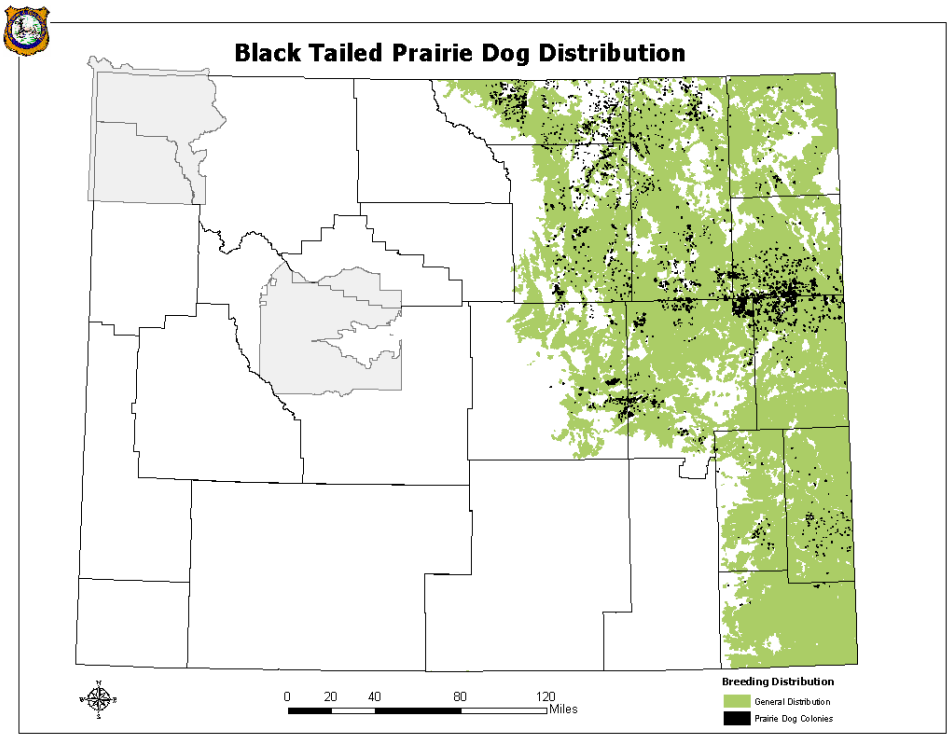


Table 10: Black-tailed prairie dog complexes in Wyoming, 2003

Complex	Total Ha	Total Ac	Number of BTPD Colonies
Arvada	14,835	36,657	673
Bill East	442	1,091	21
Casper North	2,273	5,617	12
Casper South	3,985	9,847	59
Four Corners	1,754	4,335	29
Kaycee	2,458	6,075	30
Linch	1,830	4,523	57
Moorcroft	574	1,418	23
Pleasantdale	969	2,395	71
Ross	1,400	3,460	20
Sheridan	4,054	10,018	127
Slater	792	1,956	29
Thunder Basin	40,021	98,894	422
Torrington	2,092	5,170	80
Total	**77,479**	**191,456**	**1,653**

Figure 15: **Black-tailed Prairie Dog Distribution in Eastern Wyoming, 2003**



The black-tailed prairie dog is listed as a Regional Forester's Sensitive Species and as a Management Indicator Species for the TBNG.

Based on data identified in the LRMP planning process, the following is an approximation of black-tailed prairie dog habitat acres on TBNG (see page 21-Existing Conditions for discussion on these designations):

Marginal:	389,895
Preferred:	14,679
Unknown:	83,009
Unsuitable:	65,701

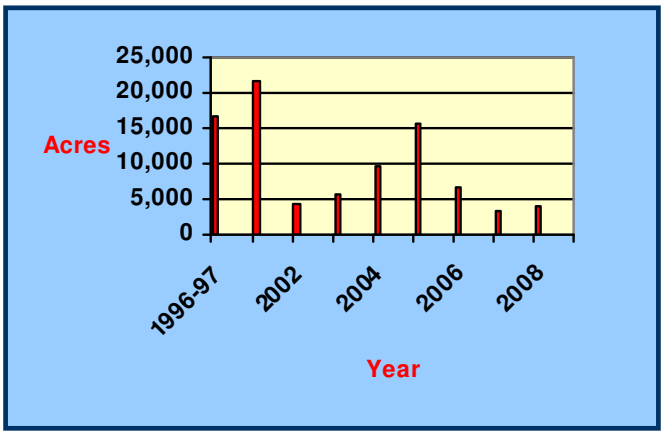
In addition, there are 1,263,324 acres of Private/State lands intermingled within the proclaimed boundary of the TBNG.

All prairie dog colonies on TBNG were mapped in 2008. Mapping was completed from June 1 – Aug 31, 2008. Some re-mapping and ground-truthing was completed from Sept 1 – Nov 15, 2008. Estimated total acres of prairie dog colonies are shown in Table 11 and Figure 16 below. Transect surveys were completed on all colonies located within the ferret reintroduction habitat and any colonies located close to reintroduction habitat perimeter. Due to landowners' concerns about the proximity of plague infested colonies to private residences; the Forest Service requested and mapped locations of private residences in relation to existing and historically occupied prairie dog colonies. There are five occupied residences within 1 mile of current or historical prairie dog colonies on the TBNG. Three of these residences are currently within 1 mile of prairie dog colonies within MA 3.63. Only one of these colonies is currently occupied.

Table 11: Estimated Total Acres of Prairie Dog Colonies

Year	Acres
1996-1997	16,589
2001	21,456
2002	4,324
2003	5,629
2004	9,550
2005	15,531
2006	6,500
2007	3,243
2008	4,000

Figure 16: Prairie Dog Population Trend



Prairie dog populations on TBNG were greatly reduced due to a sylvatic plague epizootic in 2001. Many prairie dog colonies are recovering, but the total acres of active colonies are still well below pre-plague numbers.

Even with active prairie dog colony acreages at these low levels, there are conflicts and concerns over the encroachment of prairie dog colonies onto adjacent non-federal lands. The Forest Service understands the landowner desire to control the spread of prairie dog colonies onto adjacent private land. Currently, nine prairie dog colonies totaling approximately 400 acres are within ½ mile of adjacent non-federal lands. Continued conflict and concern with regard to this issue undermines public support for the reintroduction of black-footed ferrets on the TBNG.

Black-footed ferret (*Mustela nigripes*):
The black-footed ferret is considered the most endangered mammal in North America, and the United States Forest Service is committed to recovering this species on National Forest System lands. The USFS has the greatest extent of federal land ownership across States historically occupied by ferrets.

The LRMP for the TBNG allocated 53,830 acres as Black-footed Ferret Reintroduction Habitat (MA 3.63). It is still the goal of the Forest Service to reintroduce ferrets on TBNG, but the occurrence of a plague epizootic in 2001 has delayed those efforts. Because of this epizootic, the black-tailed prairie dog population on TBNG dropped by 77 percent. Since 2001, prairie dog colonies continue to be affected by plague, and the amount of active colonies continues to fluctuate. With plague in the system, it is difficult to predict what black-tailed prairie dog populations will do in the future. Despite this uncertainty, the Forest Service continues its dedication to managing black-tailed prairie dogs on TBNG and to eventually reintroducing black-footed ferrets. The TBNG is expected to support black-footed ferret recovery within the life of the current LRMP. A successful reintroduction of black-footed ferrets on the TBNG would be an important contribution toward ferret recovery. To ensure sufficient habitat is available, TBNG has established a prairie dog shooting restriction on MA 3.63, conducted annual mapping of prairie dog colonies, and through LRMP direction provided additional standards and guidelines for activities within prairie dog colonies. The TBNG has been

identified as one of the few potential reintroduction sites for black-footed ferrets. According to the 2007 prairie dog petition, TBNG is one of seven sites left with enough acreage to reintroduce ferrets (Forest Guardians et al, 2007). However, without the availability of additional tools to reduce conflicts with local landowners, local support for reintroduction of black-footed ferrets is unlikely.

The loss of prairie dog colonies on private and state land necessitates large areas of federal land to support prairie dog colonies for black-footed ferret habitat. The overall impacts from control of prairie dogs on private lands would result in a lower prey base due to lack of prairie dogs, and therefore reduce the potential for ferret habitat.

The USFWS and WGFD are collaborating to propose a rule under Section 10(j) of the Endangered Species Act that would allow for release of black-footed ferrets on TBNG and other places in Wyoming as nonessential experimental populations. As a part of this process, the TBNG has collaborated with other federal agencies, state agencies, private landowners and organizations in the development of a comprehensive prairie dog management strategy. This strategy, if implemented, is expected to provide long term conservation of prairie dogs and contribute to habitat conditions to support a future ferret reintroduction.

The current (1988) Recovery Plan established an objective to ensure the immediate survival of the black-footed ferret by:

1) Increasing the captive population of black-footed ferrets to a census size of 200 breeding adults by 1991;
2) Establishing a prebreeding census population of 1,500 free-ranging black-footed ferret breeding adults in 10 or more populations with no fewer than 30 breeding adults in any population by the year 2010; and
3) Encouraging the widest possible distribution of reintroduced black-footed ferret populations.

The Recovery Plan is currently being updated and revised to incorporate recent information. This revision, currently in draft (2007 Revised Recovery Plan), maintains the goal for free ranging ferret populations of establishing a pre-breeding population of 1,500 black-footed ferrets in 10 or more populations with no fewer than 30 breeding adults in any population. Such a population goal might contain 2/3 female and 1/3 male with the females being a reasonable gauge to determine needed acreage since ferrets exhibit considerable within gender territoriality, but much less territorially between genders. Thus, if sufficient habitat is provided for female ferrets, the males seem to overlap and not require separate additional habitat. The revised plan estimates that a pre-breeding population of 1,500 free ranging ferrets would require approximately 185,000 acres of occupied prairie dog colonies. Based on information collected from successful reintroduction sites, prairie dog colonies can support an average density of one adult ferret per 99-148 acres in quality habitat. Given the propensity for drought at TBNG and the typically decline in prairie dog densities that accompanies drought, it is reasonable for the TBNG Plan to provide 200 acres of habitat per adult female. Using these numbers established in the 2007 draft Recovery Plan along with on site knowledge at TBNG, a minimum viable population of ferrets for TBNG would be expected to be supported on 4,000 acres of quality habitat. This is derived from providing 200 acres for 20 adult females and recognizing that 10 adult male territories

should also be supported on that same acreage. The colonies should be within 1.5 kilometers of adjacent colonies to maximize complex configuration to benefit ferret movements. If the distance between colonies becomes significantly larger 1.5 kilometers, it becomes more challenging for ferrets to move between colonies and utilize the habitat. (Larson, (USFWS), 2009)

In plague prone areas, supporting the minimum 4,000 acre goal may require management options like insecticide applications to control flea populations or vaccinations to minimize the effects of plague. Additionally, new tools are continually being evaluated that may provide additional options for future plague management. The TBNG will evaluate new plague management tools and incorporate as appropriate into LRMPs.

According to Miller et al. (2007) an adult population of 200 ferrets requires a black-tailed prairie dog complex of 6,500 ha (15,600 ac).

In a letter from USFWS, dated February 3, 2004, black-footed ferret surveys were deemed no longer necessary in black-tailed prairie dog habitat because there is a negligible likelihood of wild ferrets occurring in the state of Wyoming. This block clearance does not relieve Federal agencies from evaluating the effects of their actions on habitat that could contribute to the survival and recovery of the ferret.

Sylvatic Plague:
Plague is an infectious disease caused by the bacterium, *Yersinia pestis*. All forms of plague in wild animals are generally referred to as "sylvatic plague". Plague bacteria are transmitted to animals and humans by fleas and/or by contact with infected or flea-carrying animals (USFS SIR, 2002). Prairie dogs are highly susceptible to sylvatic (plague), which is considered to be a serious threat to the persistence of local prairie dog populations. Plague has been decimating prairie dog populations in the western two thirds of their geographic range since the 1940's (USFS, 2007b). Following an outbreak of plague, some populations can recover after several years to pre-plague conditions (Manes, 2006). Today's colonies are generally smaller in size and are more isolated, and probably render them less susceptible to plague than populations 200 years ago (Manes, 2006).

With a reduction in acres of active prairie dog colonies from plague, there will also be a corresponding reduction in habitat for those species that use prairie dog colonies as short structure habitat or burrow systems (i.e., plover, burrowing owl). There may also be a reduction in prey availability to those species that forage on prairie dogs. However, there may be an increase in high structure vegetation, which could benefit those species that prefer higher structure (i.e., sage grouse).

Plague can impact the black-footed ferret directly via infection and subsequent mortality and indirectly by destroying its primary prey base of prairie dogs. Plague quickly kills close to 100 percent of prairie dogs in a colony. Recovery efforts for the black-footed ferret are hampered because both black-footed ferrets and prairie dogs are extremely susceptible to plague (USFS, 2007b). The higher population densities and higher rates of social contact of black-tailed and Gunnison's prairie dogs particularly enhance the spread of plague (Johnson, 2005). The disease

is present throughout the range of white-tailed and Gunnison's prairie dogs and is present in approximately the western two-thirds of the range of the black-tailed prairie dog (USFS, 2007b). The vagaries of plague impacts on black-footed ferret reintroduction efforts emphasize the value of establishing wild populations in areas free of plague.

On Friday, May 25, 2001, both the U.S. Forest Service and the Wyoming Department of Health were notified of the presence of plague in the TBNG based on the findings of the Wyoming State Veterinary Lab. The U.S. Forest Service and Dr. Karl Musgrave developed a public warning notice to advise visitors and U.S. Forest Service employees of the presence of plague. A Supplemental Information Report (SIR) addressing this change in condition was completed in 2002 (USFS SIR, 2002).

The presence of plague on TBNG is and will continue to affect the ability of the USFS to maintain adequate acreages of prairie dog colonies well-distributed across the area. The best conservation strategy against plague is to maintain many colonies of prairie dogs distributed throughout their geographic range (Cully et al, 2006). This makes conservation of prairie dogs on private lands key, as 87% of all inhabited prairie dog habitat is on private land (Luce et al, 2006). If prairie dogs would be allowed to survive on private lands adjacent to federal lands, allowing connectivity to be maintained or increased promoting prairie dog movement across the landscape. This would result in larger complexes that are less likely to become extinct and more able to recolonize formerly occupied colonies. (Sidle et al, 2006)

There is a high level of uncertainty regarding plague and how it will continue to impact prairie dog populations on the TBNG. The following analyses are based on professional judgment and current, available science, and are likely an overestimate of the impacts.

3.1.1.2 Environmental Consequences– Black-tailed Prairie Dog and Black-footed Ferret

Prairie Dog Management Tools:

The following provides a brief description of each management tool (in alphabetical order), including the tool's primary objective, its environmental effects, past use on the TBNG or elsewhere, and an estimate of its cost and effectiveness.

Conservation Agreements

Description:
A Candidate Conservation Agreement (CCA) is a formal, voluntary agreement between the U.S. Fish and Wildlife Service (USFWS), one or more federal agencies and potentially additional non-federal landowners, addressing the conservation needs of one or more candidate species or species likely to become candidates in the near future. Candidate species are those species eligible for listing under the Endangered Species Act (ESA), but are currently not protected by the ESA. The primary objective of a CCA is to implement specific conservation actions designed to remove or reduce threats to the covered species, so that federal listing may not be necessary. The USFWS accomplishes this by: working with partners to identify threats to candidate species; developing conservation measures needed to address these threats and conserve the species and its habitat; identifying willing landowners; collaborating on agreements

designed to implement conservation measures; and monitoring their effectiveness (USFWS, 2009). It is the intent of the Forest Service (TBNG) to enter into a CCA with the USFWS once a mutually acceptable prairie dog management strategy is adopted.

A Candidate Conservation Agreement with Assurances (CCAA) is similar to a CCA but is only between the USFWS and non-federal property owners. In return for implementing appropriate conservation measures, non-federal participants receive assurances that they will not be required to implement additional conservation measures should the covered species be listed under the ESA (USFWS, 2009). There is a CCAA between the 4W Ranch FLP and the USFWS to undertake conservation measures for black-tailed prairie dog, mountain plover, burrowing owl and ferruginous hawk. Some of the lands designated to be managed to provide prairie dog habitat are adjacent to TBNG lands.

CCA and CCAA can be very effective in conserving candidate species and their habitats, especially across multiple land ownerships. They can be instrumental in eliminating threats to candidate species. Although there are no direct monetary costs of a CCA or CCAA, there are some indirect costs incurred through the implementation of the management tools and conservation measures.

Environmental Effects:

The environmental effects associated with implementing a CCA or CCAA depend upon the species, the area being covered, and the management tools and conservation measures. Most of the effects under agreements that cover black-tailed prairie dogs will be disclosed under the management tools discussed in this section.

Conservation Easements

Description:
In the context of this document, a conservation easement is a voluntary agreement between two parties such as the U.S. Government or non-governmental organization and a private landowner, wherein a prairie dog colony on private land is tolerated in return for a payment to the landowner. The primary objective of this tool is to reduce or mitigate the conflicts involved with unwanted prairie dog colonization on private lands by having a long term easement agreement which provides for such colonization. Currently the USFWS is considering developing such a program; and when available, it may be highly effective at meeting this objective. It has not been used on lands adjacent to the TBNG.

Environmental Effects:

The direct effects associated with this tool occur primarily on private lands. Its use may reduce the need for other active management tools to control unwanted prairie dog colonization onto private lands. It also would provide additional prairie dog colonies and habitat within the TBNG landscape.

Land Exchange or Purchase

Description:
The U.S. Forest Service can exchange like-value land parcels with willing landowners through a long and involved approval process. The primary objective of this tool is to create large blocks of NFS lands and reduce the amount of intermingled private lands and shared boundary. It can

assist in minimizing unwanted colonization onto adjacent non-federal lands, and requires a willing landowner and available NFS lands that are mutually agreeable for exchange.

The TBNG has concluded three recent land exchanges that have benefited the prairie dog, black-footed ferret, and other associated species. The Fiddleback Land Exchange exchanged 29,468 acres of federal lands for 19,068 acres of non-federal lands, and the Fiddleback II land exchange exchanged 4,380 acres of federal lands for 2,964 acres of non-federal lands. These exchanges resulted in a net gain of suitable and occupied prairie dog habitat, and a net reduction of shared private land boundary and private inholdings within the MA 3.63. The Dull Center Land Exchange exchanged approximately 4,478 acres of federal land for approximately 4,318 acres of non-federal land. This exchange gained a considerable amount of suitable and occupied prairie dog habitat, and is part of the basis for adjusting the MA 3.63 boundary.

Environmental Effects:

The direct effects associated with a land exchange depend upon surrendered and acquired resources in the land exchange. Similar to Conservation Easements, use of this management tool may reduce the need for other active management tools to control unwanted prairie dog colonization onto adjacent non-federal lands.

Plague Management

Description:

Dusting and Vaccination

The use of pesticides to reduce flea populations, which spread sylvatic plague within prairie dog colonies and complexes, can reduce outbreaks of this disease. The primary objective of dusting prairie dog colonies with a pesticide is to reduce or eliminate flea populations that are transmitting the disease to prairie dogs and other mammals. Repeated dusting of burrows with pesticides (e.g., Deltadust) is labor intensive, expensive, and not practical for large colonies and complexes (Roelle, et.al, 2005). However, it may be justified for use in high value areas such as ferret reintroduction sites. Webb et al (2006) suggests applying insecticides during the early stages of epizootics can stop the spread of plague. However, when applied in later stages of epizootics, applying insecticides failed to stop the spread of plague. It can be moderately effective at reducing populations of the plague vector and other flea species for at least 84 days (Seery et al., 2003). Cost of dusting in Conata Basin is approximately $28 per acre (R. Griebel, USFS, pers. com. 2009). There has not been any past dusting of prairie dog colonies on the TBNG.

Results from other black-footed ferret reintroduction sites suggest that flea control from dusting may afford moderate protection for local prairie dog populations, but does not eliminate plague from the dusted area. Because of this, vaccination of ferrets is may be necessary before and after reintroduction. Wild born ferrets in the Conata Basin are routinely captured and vaccinated. A similar plague vaccine is being developed for use in prairie dogs (USFWS, 2008).

Spatial Distribution of Prairie Dog Complexes

The best plague abatement strategy is to maintain many colonies and complexes of prairie dogs throughout their geographic range (Cully et al, 2006). This approach requires conservation of prairie dogs on private lands because 87% of currently inhabited prairie dog habitat is on private land (Luce et al, 2006). Conservation of prairie dogs on private lands adjacent to federal lands would maintain or increase connectivity and increase the spatial distribution of active colonies and complexes, promoting prairie dog movement across the landscape. This may result in larger complexes that are less likely to be extirpated by plague and in more source populations for those colonies that have been affected by plague (Sidle et al, 2006). The Prairie Dog Management Strategy is designed to utilize spatial distribution across the TBNG to minimize plague impacts.

The primary objectives of plague management strategies are to reduce the impact of the disease on prairie dogs and associated species by limiting the spread of the disease and increasing individual prairie dog survival.

Environmental Effects:

Plague Management (Dusting): There have been attempts to control plague epizootics by applying insecticides to prairie dog burrows. Permethrin can reduce fleas within colonies for at least three months (Cully et al, 2006) (Seery, et al., 2003). Deltadust (contains deltamethrin) is similar to permethrin, but is more resistant to moisture and can therefore suppress fleas longer (Cully et al, 2006). Insecticide dusts also kill other arthropods within prairie dog burrows (Cully et al, 2006). There could potentially be a reduction in forage for those species (i.e. burrowing owls) that feed on insects. Therefore, dusting can have both beneficial and adverse impacts on prairie dogs and associated species.

Predator Enhancement

Description:

Enhancement of predator habitat (raptor nesting platforms or perches) has often been suggested as a means of prairie dog control. Raptor nest platforms are often ineffective and impractical and expensive for the elimination or reduction of prairie dogs (Andelt, 2006). The primary objective of this tool is to use predation to reduce prairie dog densities within established colonies and survival rates of individual dispersers. On the TBNG, three raptor nest platforms have been placed at a cost of $500/platform in or near prairie dog colonies to encourage raptors to prey on resident and dispersing prairie dogs. The effectiveness of this tool at reducing prairie dog densities in existing prairie dog colonies is presumably low.

Environmental Effects:

Platforms on TBNG are not currently being utilized by raptors. Therefore, the effects to prairie dogs and associated species are minimal. Their effect on survival rates of dispersing prairie dogs is unknown. Some consideration for providing predator enhancements in MA 3.63 may need to be evaluated if black-footed ferrets are reintroduced to the area. Predation on ferrets may be a risk factor to establishing an initial population of ferrets on the TBNG.

Prescribed Burning

Description:

Burning prairie has been shown to facilitate prairie dog colony expansion (Augustine et al, 2007). The primary objective of prescribed burning is to improve habitat for prairie dogs, which

encourages prairie dogs to fill in areas that are currently inactive, or to influence the direction of colony expansion. Expansion rates onto burned areas range from 38-42% (Augustine, et al, 2007) at an average cost of $37/acre (Westbrook, USFS, Pers. Comm., 2009). Habitat manipulations designed to enhance habitat quality on the margins of existing black-tailed prairie dog colonies may be used to influence colony expansion (Milne-Laux and Sweitzer, 2006). In the spring of 2009, two prescribed burns totaling 2200 acres were completed on the TBNG to enhance habitat conditions for prairie dogs, mountain plovers and other associated wildlife.

Environmental Effects:
Late winter burning can positively affect prairie dog management and grazing management because such burns do not negatively affect herbaceous production (Augustine, 2009). By increasing colony expansion rates and using fire to expand colonies away from private land boundaries, colony acreage can increase.

Prescribed Grazing

Description:
Black-tailed prairie dogs prefer areas with low vegetative structure, a condition most often associated with concentrated livestock grazing. Resting pastures from livestock grazing can significantly decrease prairie dog populations (USFS, 2004). Significant numbers of prairie dog colonies encompass or adjoin cattle point attractants, such as water sources. The existence of cattle point attractants encourages prairie dog colonization.

Managing vegetation structure is very cost effective in large areas and can reduce population growth rates of prairie dogs on areas deferred from grazing. It may also be an effective tool in limiting re-colonization after treatment by rodenticide (Cable et al. 1987). It can also be used as a tool for creating low vegetation structure conditions to encourage prairie dog colonization. Livestock grazing can be modified through different techniques to create mosaics of vegetation structural diversity and to reduce conflict between conservation and livestock production (Derner et al, 2009).

High structure vegetation can be highly effective at limiting prairie dog colony expansion for little or no cost. Effectiveness is dependent on visual obstruction, a combination of height and density of vegetation. Based on field review on other National Grasslands, vegetation that has a Visual Obstruction Reading (VOR) of 3 inches or more is effective (USFS, 2004). A 130-135 foot buffer strip with a vegetation height of 15-16 inches and a VOR of 3-4 inches is likely adequate at reducing expansion (Terrell, 2006). A predicted buffer width necessary for zero breakthroughs ranged from 275 feet to 340 feet, with a mean of approximately 300 feet (Terrell, 2006). Drought and rainfall can influence effectiveness of vegetative barriers (Terrell, 2006). This level of structure is typically produced in lightly or moderately grazed areas, idle areas, hay land (before mowing), and in Conservation Reserve Program fields.

The primary objectives of this tool are to create high vegetation structure along private and state land boundaries that reduces prairie dog colony expansion and influences its direction. Prescribed grazing can also be used to enhance habitat and influence the direction of prairie dog expansion by creating low structure. The TBNG has not yet used this tool due to the need to complete updated Range Allotment Management Plans. As these plans are implemented,

prescribed grazing for prairie dog management will be included on a site-specific basis where colony expansion onto private lands is an issue.

Environmental Effects:
Prescribed grazing can reduce population growth rates of prairie dogs on areas deferred from grazing and may also reduce re-colonization after treatment from rodenticide (Cable et al. 1987). Livestock grazing can be modified to create mosaics of vegetation and increase structural diversity (Derner et al, 2009). It is possible that grazing disturbance may affect individuals of other species. Bird nests could be trampled, and riparian habitats could be degraded. Most of these species, including prairie dogs, have adapted to grazing whether from cattle or other wildlife species, and therefore the effects of livestock grazing are projected to be minimal.

Recreational Shooting

Description:
Recreational shooting is an activity that is often found in prairie dog colonies. Shooting is accomplished by individual recreationists. Control of prairie dog colony expansion or colony density is largely influenced by where shooting is allowed.

The primary objective of this tool is to reduce the expansion of prairie dog colonies by reducing the overall prairie dog density in the colony. This reduction in numbers or density would therefore reduce the number of prairie dogs that could expand onto neighboring private lands. There is also a desire by recreationists to allow some recreational shooting activitiy. Shooting of prairie dogs can be moderately effective in achieving this objective on a relatively small scale, but is not practical or cost effective as prairie dogs often become gun-shy (Barbalace, 2007). It has a population density reduction success rate of 35-69% (12, 13, 19).

Recreational shooters killed 1.23 million prairie dogs on non-tribal land in South Dakota in 2000 (USFS 2004). The TBNG currently prohibits recreational shooting of prairie dogs on approximately 72,500 acres of National Forest System lands within and around MA 3.63. This order was coordinated with the U.S. Fish and Wildlife Service and the Wyoming WGFD (see LRMP p. 1-16) when it was completed in 2002 and with the WGFD when it was renewed in 2008.

Environmental Effects:
Recreational shooting of prairie dogs at small colonies affects population structure and reproductive performance as evidenced by skewed sex ratios and lack of breeding yearlings in disturbed colonies. Recreational shooting can limit but not eliminate prairie dog populations (Vosburgh, et al, 1998). Shooting may limit food supply for large predators like coyotes, which could increase the chance of predation of livestock (Andelt, 2006). Shooting can dramatically alter behavior of prairie dogs, reducing body condition, reproduction and population recovery (Pauli and Buskirk, 2007b). Therefore, shooting would likely reduce the ability of prairie dogs to recover after a plague event. Prairie dog carcasses make toxic lead accessible to predators and scavengers (Pauli and Buskirk, 2007a). The use of non-expanding lead bullets can reduce the likelihood of lead consumption by non-target species (Pauli and Buskirk, 2007a).

Another effect of shooting is secondary lead poisoning of non-target species caused by lead fragments left in the prairie dog carcasses. In a study conducted in eastern Wyoming, eighty-

seven per cent of prairie dogs shot with soft point bullets and 7 percent of those shot with full metal jacket bullets contained bullet fragments. Carcasses with full metal jacket fragments averaged 19.8 mg of lead, while soft point carcasses averaged 225.2 mg (Pauli and Buskirk, 2007a). Therefore, scavengers of prairie dog carcasses, such as the bald eagle, could suffer lead poisoning.

Shooting of prairie dogs may significantly reduce prairie dog densities and indefinitely maintain reduced densities in small isolated colonies (USFS, 2007b). Shooting prairie dogs in poisoned colonies could likely prevent or slow colony recovery. Gunfire and other related disturbances may disrupt prairie dog foraging and other activities for long periods of time. Prairie dogs exhibit different behavioral patterns in colonies where shooting occurs compared to colonies where there is no shooting. Prairie dogs in shot colonies are wary and respond quickly to humans on foot and in vehicles, and may spend less time foraging than prairie dogs in non-shot colonies (USFS, 2007b). There are also potential risks to non-target species (e.g., burrowing owls) that could be killed or disturbed by shooting.

Travel management planning and potential changes in motorized access could increase or decrease opportunities for prairie dog viewing/recreational shooting.

Rodenticide (Chemical Control)

Description:
The only rodenticide approved for use on prairie dogs on the TBNG is zinc phosphide. Based on label and LRMP restrictions, zinc phosphide-treated oats can only be applied after October 1. Untreated oats are first placed at each burrow within a colony. Three days later, oats coated with zinc phosphide are placed at these same burrows. Up to 90% of a colony's prairie dogs can be killed. If this process is repeated within the following few years, it can be very effective at greatly reducing colony expansion or eliminating the colony (Forrest and Luchsinger, 2006).

The primary objectives of the use of rodenticide are for reducing unwanted colonization on private lands. The use of zinc phosphide is highly effective in achieving these objectives. The percentage of prairie dogs killed by use of this tool averages 75-85% (Barbalace, 2007) (Boren, 2003) and costs about $10/acre. Rodenticide was used on the TBNG until 1997.

Environmental Effects:
The use of rodenticide will be limited to the use of zinc phosphide, a heavy, finely ground, crystalline gray-black powder that is practically insoluble in water and alcohol. Poisoning occurs by the liberation and rapid absorption of phosphine gas (PH_3) into the bloodstream when the zinc phosphide comes into contact with the dilute acids in the stomach. This results in damage to the blood vessels and erythrocyte membranes and eventual cardiovascular collapse and irritation of the alimentary tract. Toxicosis usually is evident in 15 minutes to 4 hours following ingestion of a toxic dose. Death is usually due to anoxia (decreased amount of oxygen in organs and tissues) (Michigan DNR, 2007).

Prairie dog rodenticide (2 percent zinc phosphide bait) is highly effective in reducing prairie dog populations within treated colonies. Poisoning of non-target species can occur but is minimized when the rodenticide is applied according to label specifications (USFS, 2007b).

Zinc phosphide is fairly specific for rodents and there is no true secondary poisoning, except possibly in dogs and cats. Most animals that feed on rodents are unaffected because the zinc phosphide does not accumulate in the rodent's muscles or other tissues. However, it does remain toxic for several days in the gut of dead rodents and other animals can be poisoned if they eat enough of the gut content. This threat is lessened because most prairie dogs poisoned with zinc phosphide treated grains die inside their burrows (USFS, 2007b). Experimentally, several predators and scavengers have been exposed but only dogs and cats have been affected. Nationwide, there have been poisonings of all species of domestic livestock, dogs and cats but these are few and accidental. All animal species are subject to zinc phosphide poisoning, but avian species, specifically gallinaceous birds, are the most seriously affected (Michigan DNR, 2007).

Zinc phosphide is highly toxic to wild birds. It is also toxic to non-target mammals. Nearly sixty studies have been conducted on the toxicity of this rodenticide to wild animals. The most sensitive bird species which have been evaluated are geese, pheasants, mourning doves, quail, mallard ducks and the horned lark are also very susceptible to this compound. The seed eating animals of TBNG will be at risk of being poisoned by the zinc phosphide treated oats that could be applied as a result of proposed actions (USFS, 2007b). However, rodenticide will not be used from January 1 through September 30 as directed in the plan, which should minimize this risk to migratory birds.

Various baits have been treated with zinc phosphide concentrations of 0.75% to 2.0% (Michigan DNR, 2007). These baits include fruits (apples), vegetables (sweet potatoes), meat (hamburger, damp sausage rusks, canned dog or cat food), seeds, grains (oats, corn, wheat), cereal, and bread (bread mash). There is little deterioration of zinc phosphide baits due to the evolution of phosphide gas; therefore, dry baits must be considered toxic indefinitely. Lecithin-mineral oil, added to zinc phosphide to adhere to grain bait, offers protection against moisture and increases the poison's stability. Zinc phosphide baits may remain toxic for several months until eroded by weather, carrier decomposition, or grain removal by insects (USFS, 2007b)

Seed eating animals of the project area will be at risk. Granivorous species that exist in the project area that are either threatened, endangered or Forest Service sensitive are: black-tailed prairie dogs, sage grouse, chestnut-collared longspurs, and McCown's longspurs.

The LRMP only allows the use of rodenticides (above-ground baits) for reducing prairie dog populations during October 1 to December 31 to reduce risks to migratory birds. To reduce risk to other wildlife, the LRMP does not allow fumigants in prairie dog burrows.

The act of applying rodenticide may also directly affect some species. Trucks are used to haul pre-bait and bait over two-track trails to prairie dog colonies. All-terrain vehicles are operated on prairie dog colonies to reach all prairie dog burrows which creates additional disturbance from motorized vehicles in the habitat.

An indirect effect is the loss of habitat as a result of rodenticide use and reductions in prairie dog populations. Observations show that prairie dogs cut down tall vegetation in the colony creating low structure grassland. Expanding colonies of prairie dogs have been observed clipping

sagebrush and greasewood. Permanently removing prairie dog populations could result in a shift from a buffalograss/ blue grama sod community to a western wheatgrass/green needle community depending on the soil type. The sage grouse, which prefers tall vegetation, may be adversely impacted by an increase in prairie dog colonies. Species such as burrowing owls, mountain plovers, McCown's longspurs, chestnut-collared longspurs and swift foxes prefer short vegetation and may be positively impacted by an increase in the extent of prairie dog colonies.

Prairie dog burrows are a unique habitat for species such as burrowing owls, badgers, rabbits, black-footed ferrets, snakes, salamanders and insects. Without live prairie dogs to maintain the burrow system, the burrows will deteriorate within a few years.

A short-term indirect effect is reduction of prey base due to rodenticide use. In the long term, vegetation in poisoned prairie dog colonies can shift to a mixed grass prairie, with reduced densities of both small mammals and birds (USFS, 2007b).

Translocation

Description:
New prairie dog colonies can be established by translocating the animals to prepared sites (Long et al, 2006).

At the current time, the WGFD and the Food and Drug Administration must issue permits because there are restrictions on the interstate and intrastate movement of prairie dogs.

The primary objectives of this tool are to: 1) remove prairie dogs from colonies that are causing unwanted colonization; 2) augment prairie dog populations in colonies affected by plague, for example; or 3) create new colonies. The use of this tool can be moderately effective with a range of $30-$300 per prairie dog (average $165 per dog) (Barbalace, 2007a). Actual costs vary depending on what methods and restrictions are used and required. Survival rates range from 30-95% (Barbalace, 2007a). Optimal translocation requires: disease free prairie dogs and release site; capture site close to the release site; high trapping efficiency for a capture of 60-100 animals with sex ratio 2(F):1(M); and no history of plague at release site; and short vegetation (<12 cm (5 in.)) and pre-existing burrows at release site (Truett et al., 2001). Retention baskets of fenced enclosures may be used to reduce dispersal and predation (Truett et al., 2001). Control of predators may be needed prior to or following release (Truett et al., 2001). Translocation of prairie dogs has not taken place on the TBNG.

Environmental Effects:
Capture, transport, and release of animals must comply with federal, state, and local regulations. Methods include livetrapping, flooding burrows, and vacuuming. Livetrapping is probably the most common method. Capture should only take place in summer and early fall to minimize mortality (Long et al, 2006). Trapping during May-June causes high mortality rates, especially among juveniles (Long et al, 2006). After October; freezing soil will impede the excavation of new burrows by translocated prairie dogs (Long et al, 2006). The success of livetrapping depends on many variables: disease, genetics, habitat conditions at release sites, habitat conditions at trapping sites, disturbances (shooting, rodenticide use, etc.), time of year, time of day, and type of bait. Trapping of prairie dogs results in a loss of less than 1%, but relocation results in a 50-70% loss within a few months of release (Barbalace, 2007). Overheating is the

most common cause of mortality during livetrapping. Some prairie dogs may become sick or injured during trapping, transport, or quarantine (Long et al, 2006). Predators pose the greatest threat to translocated prairie dogs because of post-release disorientation (Long et al, 2006). Other species could be captured in traps.

Visual Barriers

Description:
Prairie dogs rely on open vistas to detect predators, to disperse, and to communicate with other prairie dogs. Tall vegetation impedes such behavior. Colony establishment and expansion can be discouraged by natural and artificial barriers (vinyl fencing, privacy fencing, vegetation) established before the emergence of juvenile prairie dogs in May.

Vinyl fencing is effective for about five years. The vinyl must be opaque, stabilized in the ground, and able to withstand extreme weather conditions. Chicken wire must be installed on the prairie dog colony side to discourage chewing. Although vinyl fencing is used around small colonies in urban and suburban settings, it is not practical or economical for large areas where they are very susceptible to wind damage (Barbalace, 2007a). Vinyl barriers are frequently breached by prairie dogs, but vinyl associated with tall vegetation is breached less frequently (Witmer et al., 2008). Corrugated metal or fiberglass extending above and below ground are rarely breached but add a substantial cost to the barrier (Witmer et al., 2008). Corrugated metal costs $60/yard and vinyl fence costs $30/yard (Witmer et al., 2008).

Privacy fencing refers to at least a 3-foot high wood-slatted fence with chicken wire installed on the prairie dog side, and edging strips in the soil along the bottom to prevent light penetration. Pine boughs or burlap can be laid against the fence to enhance the visual barrier.

The primary objectives of this tool are to create a visual obstruction that reduces the ability of prairie dogs to expand, and influences the direction of expansion. Visual barriers have not been used on the TBNG.

Environmental Effects:
Visual barriers are meant to alter the behavior of prairie dogs, to prevent them from expanding into certain areas. Neither natural nor artificial barriers have mortalities associated with them. Constructed visual barriers do not hinder prairie dog colony expansion, although some are more effective than others at slowing expansion (Merriman, et al. 2004). Vegetative barriers are generally more effective than constructed visual barriers (Terrall, et al., 2005, 2006). Visual barriers do not appear to have negative impacts on prairie dogs and associated species.

Factors That Influence Cumulative Effects

A comparison of total prairie dog colony acreage among alternatives frames the effects analysis for the species at risk. Thus, impacts on species that are dependent on high or low vegetation structure could depend on the extent of prairie dog colonies. High colony acreages result in more low vegetation structure and would benefit low structure dependent species. More colony acres would also benefit burrow-dependent species and species dependent upon the prey inhabiting colonies. Low colony acreages, result in more high vegetation structure and would benefit high structure dependent species.

In addition, there are several factors that will influence or add to the cumulative impacts of the alternatives and the other past, present and reasonably foreseeable future activities that are occurring or will occur within the landscape.

Drought: Extended periods of low precipitation (drought) reduce plant productivity. The increase in prairie dog colony acreage resulting from drought in combination with action alternatives that favor high prairie dog colony acreages may benefit the black-footed ferret. However, as colony acreage increases due to drought there may be a decrease in the densities of prairie dogs.

Prairie dog control on state and private land: Most livestock producers in the Great Plains do not support the expansion prairie dog colonies because prairie dogs feed on many of the same plant species utilized by livestock and so they are viewed as competing for forage for their livestock. For decades, many states listed prairie dogs as agricultural pests and poisoning prairie dogs on state and private lands was routinely performed. The state of Wyoming currently lists the prairie dog as an agricultural pest. Although rare, some ranchers have reported prairie dog burrows are a leg-breaking hazard to their cows and horses. Although private landowners will tolerate small numbers of prairie dogs, most prairie dog colonies on state and private land are subjected to periodic control. The overall impacts from control of prairie dogs on state and private lands to the bald eagle and other raptors would result in a lower prey base due to lack of prairie dogs.

SUMMARY OF RELATIVE IMPACTS

The impacts of the alternatives to wildlife can best be summarized by grouping the species into 5 categories: granivorous (seed eaters), predators, animals that prefer high structured grassland, animals that prefer low structure grassland, and animals that use or live in prairie dog burrows (Table **12**).

Granivorous animals could be directly affected by eating the poison-laced grain and dying. The alternatives are ranked from higher to lower relative impacts based upon estimates of rodenticide use as described in the alternatives (Table 5). But the possibility exists that as prairie dogs are allowed to expand within the Category 1 Prairie Dog Habitat, more control will take place on adjoining private lands.

Predators are attracted to abundant prey that commonly exists in prairie dog colonies. An increase in prairie dog colony acreage will have a beneficial impact on these species while a decrease will have a adverse impact.

Species that prefer high grassland structure avoid prairie dog colonies and an increase in prairie dog acreages could be detrimental to them. Under the management direction of the LRMP, a specified amount of high structure grassland will be provided on each Geographic Area (GA), and this would not change under any alternative. For this reason, there is no impact due to changes in vegetation structure anticipated on these species under any of the alternatives.

Species that prefer low grassland structure are attracted to prairie dog colonies and an increase in prairie dog colony acreage could be beneficial to them. Objectives for the amount of low

structure habitat on each GA are set in the LRMP, and would not change under any alternative. Environmental analysis completed for the LRMP determined that these levels are adequate for the viability of these species. For this reason, there is no impact due to changes in vegetation structure anticipated on these species under any of the alternatives.

Prairie dog burrow-dependent species use burrows for hunting, denning, nesting, or any activity in their life cycle. Some of these species (black-footed ferret and burrowing owl) are completely dependent upon prairie dog colonies and will be greatly impacted by the range of acreages being treated in the alternatives. An increase in prairie dog acreages will have a beneficial impact on these species while a decrease will have a adverse impact.

Table 12: Relative impacts on species groups by each alternative

Animal Category	Variable used to determine impact	Relative adverse impact by alternative				
		High Impact ◄			► Low Impact	
Seed Eater[1]	Amount of rodenticide use	Alt. 3	Alt. 2	Alt. 5	Alt. 4	Alt. 1
Predator[2]	Acres of Prairie dog colonies	Alt. 3	Alt. 2	Alt. 5	Alt. 4	Alt. 1
Prefers High Grassland Structure[3]	Acres of Prairie dog colonies	All alternatives - No impact (Grassland Structure Objectives are set in the LRMP)				
Prefers Low Grassland Structure[4]	Acres of Prairie dog colonies	All alternatives - No impact (Grassland Structure Objectives are set in the LRMP)				
Uses the Prairie Dog Burrows[5]	Acres of Prairie dog colonies	Alt. 3	Alt. 2	Alt. 5	Alt. 4	Alt. 1

[1]black-tailed prairie dogs, chestnut-collared longspurs, McCown's longspurs

[2]black-footed ferrets, swift foxes, bald eagles (and other raptors), ferruginous hawks, and burrowing owls

[3]greater sage grouse, (and sharp-tailed grouse as MIS)

[4]mountain plovers, McCown's longspurs, chestnut-collared longspurs, and swift foxes

[5]black-footed ferretsand burrowing owls

3.1.1.2.1 Alternative 1-No Action

The analysis of environmental effects for each of the available prairie dog management tools is provided above. Under this alternative, the estimated amount of average annual use for the following tools is:

- There is no proposed rodenticide use with this alternative, except for situations where there is an eminent threat to public health or existing infrastructure. These exceptions are described in the LRMP.
- no use of conservation agreements
- 1500-2500 acres of prescribed burning
- 35 miles of boundary management through prescribed grazing
- recreational shooting prohibited in MA 3.63, allowed on all other NFS acres
- 300-400 acres of prairie dog translocations
- 10 miles of artificial visual barriers

Direct and Indirect Effects

Effects to Black-footed Ferret Reintroduction Habitat (MA 3.63)

There would be no changes to the MA 3.63 boundary under this alternative.

Effects to Black-tailed Prairie Dogs

The effects to black-tailed prairie dogs are the same as those provided in the FEIS for the 2001 revision of the TBNG LRMP. This alternative is based on the current LRMP and current prairie dog management occurring on the TBNG which did not set specific acreage objectives for prairie dogs. The current management objective for prairie dogs located on TBNG is to manage populations through non-lethal methods and limit rodenticide use to situations where human health and safety or infrastructure is threatened.

This alternative maximizes potential prairie dog expansion on NFS lands by limiting the use of rodenticides more than any other alternative. Moderate amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions. Relatively high amounts of expected use of translocation and visual barriers may be necessary to minimize land owner conflicts. High amounts of translocation may also be used to augment prairie dog populations on the TBNG. The current recreational shooting prohibition in MA 3.63 may promote healthy breeding populations of prairie dogs in that area. However, all other colonies on the TBNG would be exposed to this activity.

Effects to Black-footed Ferrets

The effects to Black-footed ferrets are the same as those provided in the FEIS for the 2001 revision of the TBNG LRMP. There are no anticipated adverse effects to black-footed ferrets because current management is designed to maintain viable prairie dog populations and provide habitat conditions to support black-footed ferret reintroduction.

Planned and managed activities anticipated under the LRMP may temporarily modify existing grassland conditions, and are designed to maintain or move existing conditions toward desired conditions (as described in the LRMP), if not already met. Changes in current vegetation conditions would be generally minor, and therefore should not decrease suitable habitat for black-footed ferrets.

The predicted maximum extent of prairie dogs within MA 3.63 and the moderate use of prescribed burning and grazing to promote prairie dog habitat supports reintroduction of the black-footed ferret. The limitation on the use of rodenticides to control unwanted colonization onto adjacent non-federal lands undermines local support for reintroduction efforts.

Effects Determination

This alternative will have **no effect** to black-footed ferret because the species is not present. Under the current LRMP, the amount and quality of habitat for the black-footed ferret was expected to improve and to be capable of supporting a reintroduced population. No further consultation with USFWS is required. This alternative would not help to resolve local concerns about prairie dog conservation and black-footed ferret recovery on the TBNG, although it does provide for future conservation of the species.

3.1.1.2.2 Alternative 2-Proposed Action

The analysis of environmental effects for each of the available prairie dog management tools is provided above. Under this alternative, the estimated amount of average annual use for the following tools is:

- Based on current population estimates, approximately 398 acres may be considered for treatment using rodenticide. These acres are associated with colonies that are currently identified for control. However other methods besides rodenticide may be used, depending on the situation. Each colony will be evaluated on a case by case basis before determining whether rodenticide would be used.
- 1-3 conservation agreements
- 1000-1500 acres of prescribed burning
- 25 miles of boundary management through prescribed grazing
- recreational shooting is prohibited in MA 3.63 and on NFS lands within Category 2 Prairie Dog Habitat areas, allowed on all other NFS acres
- 200-300 acres of prairie dog translocations
- 3 miles of artificial visual barriers

Direct and Indirect Effects

Effects to Black-footed Ferret Reintroduction Habitat (MA 3.63)

Table 13 summarizes the changes in the prairie dog habitat within the MA 3.63 as a result of the boundary modification as described in Alternative 2:

Table 13: Alternative 2-Acres within the MA 3.63

	Alternative 1 (No Action)	Alternative 2
Total acres	58,111	52,190
Acres of NFS	54,097	47,442
Acres of non-federal inholdings	4,014	4,748
Prairie Dog Habitat Suitability:		
NFS Acres of Preferred Habitat	7,289	7,411
NFS Acres of Marginal Habitat	36,127	32,533
NFS Acres of Unsuitable Habitat	6,055	3,995
Total NFS Acres Occupied by Prairie Dogs over the past 10 years	13,444	14,340
Total NFS Acres Currently Occupied by Prairie Dogs	2,400	2,226
Total Miles of Shared Boundary with Non-federal Land Owners	34	7

The following provides information related to proposed changes to the current MA 3.63 boundary. The MA 3.63 boundary configuration for this alternative:

- contains less total prairie dog habitat than the current MA 3.63;
- contains a similar amount of preferred habitat as the current MA 3.63;
- contains approximately 1000 acres more historically occupied habitat than the current;
- contains approximately 200 acres less of currently occupied acres than the current, those acres are currently in conflict due to proximity to non-federal lands and on state lands;
- reduces the amount of unsuitable habitat by approximately 2000 acres and
- only shares 7 miles of boundary with adjacent non-federal land owners.

Effects to Black-tailed Prairie Dogs

The loss of prairie dog colonies on private and state land necessitates large areas of federal land to support prairie dog colonies for black-footed ferret habitat. The overall impacts from control of prairie dogs on private lands would result in a lower prey base due to lack of prairie dogs, and therefore would reduce the potential for ferret habitat.

Shooting prairie dogs in colonies that have been previously poisoned could likely prevent or slow population recovery in those colonies. Also, gunfire and other related activity and disturbances may disrupt prairie dog foraging and other activities for extended periods of time. Prairie dogs exhibit different behavioral patterns in colonies where shooting occurs compared to colonies where there is no shooting. There is a shooting restriction already in place on TBNG that protects from shooting, 72,500 acres of prairie dog habitat. This shooting restriction also includes the ferret reintroduction habitat currently identified in the plan. This shooting restriction will be adjusted to include the additional ferret reintroduction habitat.

Lower amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions. The current and future CCAAs will provide for some protection of prairie dogs on private lands which would contribute to prairie dog viability in the Thunder Basin complex and eastern Wyoming. The addition of two Category 2 Prairie Dog Habitat areas may provide some ability to slow or minimize the effects of sylvatic plague. Relatively low amounts of expected use of translocation and visual barriers may be used to minimize land owner conflicts. The use of rodenticides to lethally control prairie dog colonies that are threatening adjacent non-federal land is increased. However, the use of rodenticides in MA 3.63 will not occur until the total acres of active prairie dogs exceed 18,000 acres in this management area, except for situations of threats to public health or to infrastructure. The current recreational shooting prohibition in MA 3.63 and that proposed for the NFS lands in Category 2 areas may promote healthy breeding populations of prairie dogs in those areas. All other colonies on the TBNG would be exposed to this activity.

The presence of plague on Thunder Basin National Grassland is and will continue to affect the ability of the USFS to maintain acreages of prairie dog colonies suggested in any of the alternatives and in the Prairie Dog Management Strategy.

Effects to Black-footed Ferrets

Black-footed ferret habitat is not expected to be adversely impacted grassland-wide by adjusting the MA 3.63 boundary. Changing the MA 3.63 boundary is expected to have positive effects by including more existing prairie dog colonies and potential prairie dog habitat. The proposed MA 3.63 will be approximately the same size as the current MA 3.63; therefore there is not a loss of acreage for the Black-footed Ferret Reintroduction Habitat. By changing the MA 3.63, more prairie dog colonies are protected from lethal control than there are currently. This will provide more habitats for those species that use prairie dog colonies over the long term.

Black-footed ferret habitat could potentially be adversely affected by using rodenticide in any prairie dog colonies outside of the MA 3.63. Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens, Appendix B), any colony that is subject to rodenticide use could be used as habitat by ferrets. There would

be no rodenticide use within the Ferret Reintroduction Habitat (3.63) until after acreage objectives are reached (18,000 acres). And if ferrets are released in the future, the likelihood is that most of them will stay within the majority of the MA 3.63 since that is where the largest acreage of large prairie dog colonies is located.

Again, if there is a release of ferrets in the future, there would be little chance of secondary poisoning from eating poisoned prairie dogs. Results of studies generally indicate that zinc phosphide, when applied according to label directions, poses little secondary risk to non-target wildlife. Zinc phosphide breaks down rapidly in the digestive tract of affected animals, so predators and scavengers are generally not exposed to the compound. (USFS, 2007b)

Based on historical population levels and the current availability of prairie dog habitat within the proposed MA 3.63 there should be sufficient prairie dog habitat to support reintroduction of the black-footed ferret. The availability of rodenticides to control unwanted colonization onto adjacent non-federal lands is expected to provide increased local support for reintroduction efforts.

Effects Determination
This alternative will have **no effect** to black-footed ferrets because the species is not present. There will be direct effects to habitat, namely prairie dog colonies, but these effects are expected to be minimal. Consultation may be required if rodenticide use was to occur in Category 1, but no rodenticide use is expected to occur because of the limited circumstances under which it could occur. This alternative would help to gain local public support for prairie dog conservation and black-footed ferret recovery on the TBNG, which would facilitate a future reintroduction and conservation of the species.

3.1.1.2.3 Alternative 3-Boundary Management

The analysis of environmental effects for each of the available prairie dog management tools is provided above. Under this alternative, the estimated amount of average annual use for the following tools is:

- Based on current population estimates, approximately 643 acres would be treated with rodenticide. These acres are associated with colonies that are currently within ½ mile of adjacent non-federal lands.
- no use of conservation agreements
- 1500-2200 acres of prescribed burning
- 100+ miles of boundary management through prescribed grazing
- recreational shooting prohibited in MA 3.63, allowed on all other NFS acres
- 300-400 acres of prairie dog translocations
- 10 miles of artificial visual barrier

Direct and Indirect Effects
Effects to Black-footed Ferret Reintroduction Habitat (MA 3.63)

Table **14** summarizes the changes in the prairie dog habitat within the MA 3.63 as a result of the boundary modification as described in Alternative 3:

Table 14: Alternative 3-Acres within the MA 3.63

	Alternative 1 (No Action)	Alternative 3
Total acres	58,111	58,111
Acres of NFS	54,097	54,097
Acres of non-federal inholdings	4,014	4,014
Prairie Dog Habitat Suitability:		
NFS Acres of Preferred Habitat	7,289	7,289
NFS Acres of Marginal Habitat	36,127	36,127
NFS Acres of Unsuitable Habitat	6,055	6,055
Total NFS Acres Occupied by Prairie Dogs over the past 10 years	13,444	13,444
Total NFS Acres Currently Occupied by Prairie Dogs	2,400	2,400
Total Miles of Shared Boundary with Non-federal Land Owners	34	34

The MA 3.63 boundary configuration contains the same prairie dog habitat conditions as those in the current MA 3.63 (Alternative 1).

Effects to Black-tailed Prairie Dogs
The characteristics of Thunder Basin National Grassland would be changed through the implementation of this alternative by increasing human activities, disturbance, and increased noise levels associated with rodenticide use activities, and loss of 60 – 91% of all prairie dog habitat. Rodenticide use will take place every year in the same areas as needed to maintain the ½ mile buffer around adjacent private land and no grazing would be allowed within the ½ mile buffer.

Not only would this alternative reduce the number of acres of prairie dog colonies, but it would also limit the spatial distribution of colonies by consolidating them to only a few places on TBNG. This limits the ability to manage prairie dogs across the planning unit, and in turn adversely impacts the viability of the species across the planning unit, as well as the viability of other species that are associated with prairie dog colonies, especially the black-footed ferret.

This alternative allows the highest expected use of rodenticides for lethal control of prairie dogs within ½ mile of adjacent non-federal lands. Although the expected use of prescribed burning, prescribed grazing and translocation are relatively high in this alternative, they are expected to be used to concentrate prairie dog populations on NFS acres greater that ½ mile from non-federal lands. These actions will greatly limit the extent and spatial distribution of prairie dog populations on the TBNG.

Effects to Black-footed Ferrets
Black-footed ferret habitat is expected to be adversely impacted by using rodenticide within 1/2 mile of all grassland acres adjacent to private lands inhabited by prairie dogs. This would include poisoning a significant portion of the prairie dog population within MA 3.63 (Black-footed Ferret Reintroduction Habitat), thereby making a future ferret reintroduction highly unlikely.

The loss of prairie dog colonies on private and state land necessitates large areas of federal land for black-footed ferret habitat. The overall impacts from control of prairie dogs on private lands would result in a lower prey base due to lack of prairie dogs, and therefore reduce the potential for ferret habitat.

Shooting prairie dogs in colonies that have been previously poisoned on this large of scale would likely prevent population recovery in those colonies. Also, gunfire and other related activity and disturbances may disrupt for extended periods of time any surviving prairie dogs while foraging or engaged in other activities. Prairie dogs exhibit different behavioral patterns in colonies where regular shooting occurs compared to colonies where there is no shooting.

Effects Determination
This alternative would result in a 'no effect" determination for black-footed ferrets because they are not present. However, this alternative would result in long-term adverse effects on potential black-footed ferret habitat. This alternative would not facilitate a future reintroduction of black-footed ferrets on TBNG because it does not provide sufficient habitat to support a self-sustaining population of ferrets.

3.1.1.2.4 Alternative 4-Adjusted Management Area and Limited Rodenticide Use

The analysis of environmental effects for each of the available prairie dog management tools is provided above. Under this alternative, the estimated amount of average annual use for the following tools is:

- Based on current population estimates, approximately 200 acres may be considered for treatment using rodenticide. These acres are associated with colonies that are currently identified as an unwanted threat to adjacent non-federal lands. However other methods besides rodenticide may be used, depending on the situation. Each colony will be evaluated on a case by case basis before determining whether rodenticide would be used.
- 1 conservation agreements
- 2500-3000 acres of prescribed burning
- 38 miles of boundary management through prescribed grazing
- recreational shooting prohibited in MA 3.63 and on all other NFS lands, except for those colonies identified for lethal control
- 300-400 acres of prairie dog translocations
- 7 miles of artificial visual barriers

Direct and Indirect Effects
Effects to Black-footed Ferret Reintroduction Habitat (MA 3.63)

Table 15 summarizes the changes in the prairie dog habitat within the MA 3.63 as a result of the boundary modification as described in Alternative 2:

Table 15: Alternative 4-Acres within the MA 3.63

	Alternative 1 (No Action)	Alternative 4
Total acres	58,111	68,522
Acres of NFS	54,097	63,082
Acres of non-federal inholdings	4,014	5,440
Prairie Dog Habitat Suitability:		
NFS Acres of Preferred Habitat	7,289	8,624
NFS Acres of Marginal Habitat	36,127	42,993
NFS Acres of Unsuitable Habitat	6,055	6,786
Total NFS Acres Occupied by Prairie Dogs over the past 10 years	13,444	20,930
Total NFS Acres Currently Occupied by Prairie Dogs	2,400	2,400
Total Miles of Shared Boundary with Non-federal Land Owners	34	29

The following provides information related to proposed changes to the current MA 3.63 boundary. The MA 3.63 boundary configuration for this alternative:

- contains the greatest amount of total prairie dog habitat;
- contains the most preferred habitat (greater than 1200 acres more than any of the other alternatives);
- contains greater than 6500 acres more historically occupied habitat than any other alternative; and
- shares 29 miles of boundary with adjacent non-federal land owners.

Effects to Black-tailed Prairie Dogs

This alternative is a modified Alternative 2, but with a larger Black-footed Ferret Reintroduction Habitat, (MA 3.63) to include lands acquired in the Dull Center land exchange, and limit rodenticide use to no more than 5% of the population, which is half the average annual growth rate. The current management objective for prairie dogs located on Thunder Basin National Grassland is to manage populations through non-lethal methods and limit rodenticide use to only those situations where human health and safety is threatened or infrastructure is adversely impacted. There would be only minor potential adverse effects to black-footed ferrets because habitat conditions to eventually support a ferret reintroduction would be provided and use of rodenticide would be very limited within and outside MA 3.63.

Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens in Appendix B), any colony that is poisoned may be used as habitat by all species. The limitation of rodenticide to no more than 5% of the population growth should decrease some of the impact. Based on existing data, the 5% cap should eliminate rodenticide use in some years due to the fact that annual population growth is sometimes less than 5%. This means that in some years no rodenticide would be used, even under those special circumstance described in the decision screen.

Planned and managed activities anticipated with this alternative (as described above) may temporarily modify existing grassland conditions and are designed to maintain or move existing

conditions toward desired vegetative conditions (as described in the LRMP), if not already met. Changes in current vegetation conditions would be temporary and generally minor and therefore should not decrease suitable habitat for sensitive species.

Prescribed burning and prescribed grazing are expected to be used in relatively high amounts to enhance prairie dog habitat conditions. The addition of two Category 2 Prairie Dog Habitat areas may provide some ability to slow or minimize the effects of sylvatic plague. High amounts of expected use of translocation and visual barriers may be used to minimize land owner conflicts. High amounts of translocation may also be used to augment prairie dog populations on the TBNG. The use of rodenticides to lethally control prairie dog colonies that are threatening adjacent non-federal land is low compared to other alternatives. The use of rodenticides in MA 3.63 will not occur until the total acres of active prairie dogs exceed 18,000 acres in this management area, except for situations of threats to public health or to infrastructure; and its use will not occur on any NFS lands on the TBNG. Because recreational shooting opportunities are only allowed on colonies identified for lethal control, healthy, undisturbed breeding populations of prairie dogs are promoted across the TBNG.

Effects to Black-footed Ferrets

Black-footed ferret habitat could potentially be affected by using rodenticide in any prairie dog colonies outside of the MA 3.63. Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens Appendix B4), any colony that is poisoned could be used as habitat by ferrets. There would be no rodenticide use within the Ferret Reintroduction Habitat (3.63) until after acreage objectives are reached (18,000 acres). And if ferrets are released in the future, the likelihood is that most of them will stay within the majority of MA 3.63 since that is where the majority of the large prairie dog colonies are located.

Again, if there is a release of ferrets in the future, there would be little chance of secondary poisoning from eating poisoned prairie dogs. Results of studies generally indicate that zinc phosphide, when applied by label directions, poses little secondary risk to non-target wildlife. Zinc phosphide breaks down rapidly in the digestive tract of affected animals, so predators and scavengers are generally not exposed to the compound. (USFS, 2007b)

Based on historic population levels and the current availability of prairie dog habitat within the proposed MA 3.63 there should be sufficient prairie dog habitat to support reintroduction of the black-footed ferret. The limited availability of rodenticides to control unwanted colonization onto adjacent non-federal lands may provide increased local support for reintroduction efforts.

The loss of prairie dog colonies on private and state land necessitates large areas of federal land to support prairie dog colonies for black-footed ferret habitat. The overall impacts from control of prairie dogs on private lands would result in a lower prey base due to lack of prairie dogs, and therefore reduce the potential for ferret habitat.

Shooting prairie dogs in colonies that have been previously poisoned could likely prevent or slow population recovery in those colonies. Also, gunfire and other related activity and disturbances may disrupt prairie dog foraging and other activities for extended periods of time.

Prairie dogs exhibit different behavioral patterns in colonies where shooting occurs compared to colonies where there is no shooting. There is a shooting restriction already in place on TBNG that protects from shooting 72,500 acres of prairie dog habitat. This shooting restriction also includes the ferret reintroduction habitat currently identified in the plan. This shooting restriction will be expanded to include the proposed ferret reintroduction habitat.

Effects Determination
This alternative will result in a **no effect** determination for black-footed ferret. Because the species is not present, there will be no direct, indirect or cumulative effects to the species. There will be indirect effects to habitat, namely prairie dog colonies, but is expected to be minimal. Consultation may be required if rodenticide use was to occur in the Category 1 Area, but no rodenticide use is expected to occur because of the limited circumstances under which it could occur. This alternative would help to gain local public support for prairie dog conservation and black-footed ferret recovery on the TBNG, which would facilitate a future reintroduction while still maintaining for viability and conservation of these species.

3.1.1.2.5 Alternative 5-Additional Category 2 Areas

The analysis of environmental effects for each of the available prairie dog management tools is provided above. Under this alternative, the estimated amount of average annual use for the following tools is:

- The amount of projected rodenticide use under this alternative would be the same as Alternative 2.
- 1-3 conservation agreements
- 1500-2000 acres of prescribed burning
- 81 miles of boundary management through prescribed grazing
- recreational shooting prohibited in MA 3.63 and on NFS lands within Category 2 Prairie Dog Habitat areas, allowed on all other NFS acres
- 200-300 acres of prairie dog translocations
- 5 miles of artificial visual barriers

Direct and Indirect Effects
Effects to Black-footed Ferret Reintroduction Habitat (MA 3.63)
Table 16 summarizes the changes in the prairie dog habitat within the MA 3.63 as a result of the boundary modification as described in Alternative 5:

Table 16: Alternative 5-Acres within the MA 3.63

	Alternative 1 (No Action)	Alternative 5
Total acres	58,111	52,190
Acres of NFS	54,097	47,442
Acres of non-federal inholdings	4,014	4,748
Prairie Dog Habitat Suitability:		
NFS Acres of Preferred Habitat	7,289	7,411
NFS Acres of Marginal Habitat	36,127	32,533
NFS Acres of Unsuitable Habitat	6,055	3,995
Total NFS Acres Occupied by Prairie Dogs over the past 10 years	13,444	14,340
Total NFS Acres Currently Occupied by Prairie Dogs	2,400	2,226
Total Miles of Shared Boundary with Non-federal Land Owners	34	7

The MA 3.63 boundary configuration for this alternative contains same amounts of prairie dog habitats as Alternative 2.

Effects to Black-tailed Prairie Dogs

This Alternative is a modification of Alternative 2 with three additional category 2 areas. In addition to the Middleton and 4W Category 2 Areas, there is the addition of North 450, South Cellers, and Piney Creek Category 2 Areas. All three areas are predominantly in NFS lands. Black-footed ferret habitat is not expected to be adversely impacted by adjusting the MA 3.63 boundary. Changing the MA 3.63 boundary is expected to have positive effects, by including more existing prairie dog colonies and potential prairie dog habitat. The proposed MA 3.63 will be approximately the same size as the current MA 3.63, therefore there is not a loss of acreage for the Ferret Reintroduction habitat. By changing the MA 3.63, more prairie dogs colonies are protected from lethal control than currently. This will provide more habitat and protections for those species that use prairie dog colonies.

Lower amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions. The current and future CCAAs will provide for some protection of prairie dogs on private lands which would contribute to prairie dog viability in the Thunder Basin complex and eastern Wyoming. The addition of five Category 2 Prairie Dog Habitat areas may provide some ability to slow or minimize the effects of sylvatic plague. Relatively low amounts of expected use of translocation and visual barriers may be used to minimize land owner conflicts. The use of rodenticides to lethally control prairie dog colonies that are threatening adjacent non-federal land is increased. However, the use of rodenticides in MA 3.63 will not occur until the total acres of active prairie dogs exceed 18,000 acres in this management area, except for situations of threats to public health or to infrastructure. The current recreational shooting prohibition in MA 3.63 and that proposed for the NFS lands in Category 2 areas may promote healthy breeding populations of prairie dogs in those areas. All other colonies on the TBNG would be exposed to this activity.

Effects to Black-footed Ferrets

Black-footed ferret habitat could potentially be affected by using rodenticide in any prairie dog colonies outside of the MA 3.63. Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens, Appendix B2), any colony that is poisoned could be used as habitat by ferrets. There would be no rodenticide use within the Black-footed Ferret Reintroduction Habitat (3.63) until after acreage objectives (18,000 acres) are reached. And if ferrets are released in the future, it is likely that most of them will stay within the MA 3.63 since that is where the majority of the large prairie dog colonies exist.

Again, if there is a release of ferrets in the future, there would be little chance of secondary poisoning from eating poisoned prairie dogs. Results of studies indicate that zinc phosphide, when applied by label directions, poses little secondary risk to non-target wildlife. Zinc phosphide breaks down rapidly in the digestive tract of affected animals, so predators and scavengers are generally not exposed to the compound. (USFS, 2007b)

The loss of prairie dog colonies on private and state land necessitates large areas of federal land to support prairie dog colonies to support black-footed ferret reintroduction. The overall impacts of control of prairie dogs on private lands have resulted in a lower prey base due to lack of prairie dogs and therefore reduces the potential for ferret habitat.

Shooting prairie dogs in colonies that have been previously poisoned could likely prevent or slow population recovery in those colonies. Also, gunfire and other related activity and disturbances may disrupt prairie dog foraging and other activities for extended periods of time. Prairie dogs exhibit different behavioral patterns in colonies where shooting occurs compared to colonies where there is no shooting. There is a shooting restriction already in place on TBNG that protects from shooting 72,500 acres of prairie dog habitat. This shooting restriction also includes the ferret reintroduction habitat currently identified in the LRMP. This shooting restriction will be adjusted if needed, to include the proposed additional ferret reintroduction habitat.

The presence of plague on Thunder Basin National Grassland is and will continue to affect the ability of the USFS to maintain acreages of prairie dog colonies suggested in any of the alternatives and in the Prairie Dog Management Strategy. The inclusion of additional Category 2 Areas may help lessen the impact of the effects of plague to prairie dog populations.

Based on historic population levels and the current availability of prairie dog habitat within the proposed MA 3.63 there should be sufficient prairie dog habitat to support reintroduction of the black-footed ferret. The availability of rodenticides to control unwanted colonization onto adjacent non-federal lands is expected to provide increased local support for reintroduction efforts.

Effects Determination

This alternative results in a **no effect** determination for black-footed ferret. Because the species is not present there will be no direct, indirect or cumulative effects to the species. There will be indirect effects to habitat, namely prairie dog habitat, but this is expected to be minimal. Consultation with USFWS would be required if rodenticide use was to occur in the Category 1 Area, however, no rodenticide use is expected to occur. This alternative would help to gain local public support for prairie dog conservation and black-footed ferret recovery on the TBNG, which would facilitate a future reintroduction while still maintaining for viability and conservation of these species.

Cumulative Effects Process

The Council on Environmental Quality defines cumulative impact 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 nonfederal) or person undertakes such actions (40 CFR §1508.7). Cumulative effects have been assessed based on past actions within recorded history (200-0 years before present) and approximately 10-15 years into the future. Looking 10-15 years into the future is appropriate based upon project planning cycles (36 CFR §219.7 (4), USDA FS MBNF 2003). Because it is difficult to predict how effects to a single population might influence the status of other populations, cumulative effects were analyzed at the scale of the TBNG project analysis area.

Cumulative Effects Common to All Alternatives

Livestock grazing, oil and gas exploration and development, coal mining, hunting and dispersed recreation are the dominant human activities occurring within the TBNG analysis area, including federal and non-federal lands (state and private). These activities have occurred in the past and are expected to continue into the reasonably foreseeable future

Future activities may include increased oil and gas exploration, increased recreational use, prescribed fire, and continued livestock grazing with additional range improvements. The increase in oil exploration and development may contribute to wildlife habitat fragmentation and disturbance. Also, with the increase in recreation use (both managed and unmanaged), there may be an overall increase in human disturbance to wildlife. Roads and trails associated with recreation and mineral development may also contribute to prairie dog habitat fragmentation.

Oil, gas, and mineral extraction are expected to continue on TBNG in the foreseeable future. On NFS lands, prairie dog colonies are largely unaffected by mineral development because most mineral development is currently outside the bulk of the prairie dog colonies on the TBNG. Those projects that are located near prairie dog colonies are limited to when and where they can develop facilities to protect colonies. Impacts to prairie dogs on TBNG from mineral development are limited and are expected to remain that way under all alternatives.

Any regulatory mechanisms already established, like label directions on rodenticide, will be followed. Additional regulatory mechanisms that deal with hunting wildlife are outside USFS authority, and are determined by the state.

Plague is probably the most influential factor in prairie dog population management on TBNG, because it is unpredictable and unmanageable and will continue to be in the foreseeable future. Plague will continue to be a factor in how prairie dogs are managed on the TBNG.

These past, present, and possible future activities are expected to continue at similar rates and extents under all of the alternatives, including the No Action (Alternative 1) regardless of which one is implemented. The effects of these activities were analyzed and disclosed in the FEIS, Biological Assessment and Biological Evaluation for the 2001 revision of the TBNG LRMP.

Additional Cumulative Effects-Alternatives 2, 4, and 5

For Alternatives 2, 4, and 5; the current shooting restriction will remain in place and expanded to cover the larger MA 3.63 and NFS lands in the Category 2 areas. Additionally, Alternative 4 would extend shooting restrictions to all prairie dog colonies on NFS lands except those identified for lethal control. Prairie dog populations on NFS lands of the TBNG will be managed to maintain viability and provide habitat for other species that depend upon prairie dog colonies. Rodenticide will not be applied if the population viability is in question or if other species are dependent upon prairie dog habitat for their viability. Rodenticide application will only be applied under very specific circumstances (refer to screens, Appendix B2, B4 and B5), and considered as a last resort if other methods fail. It is meant to be a tool for long term management of prairie dog populations in such a way that we reduce conflict with other uses, and yet maintain/increase populations to a level where black-footed ferrets may be reintroduced and habitat for other species is maintained.

Alternatives 2, 4, and 5 will not conflict with the current LRMP or future objectives to manage the area for black-footed ferrets. It is possible that conflicts over prairie dog expansion on to private lands located within TBNG will continue without implementation of one of these alternatives. The FS remains focused on reintroducing ferrets, the most endangered mammal in North America, and to the recovery of this species. The Forest Service (FS) is also dedicated to maintaining viable populations of prairie dogs, which are the main food source for endangered black-footed ferrets. With the TBNG being only 0.5% of the national black-tailed prairie dog population (0.04% of national population proposed for control) there is little chance that implementation of one of these alternatives would contribute to the decline of the national population estimate.

Additional Cumulative Effects-Alternative 3
The presence of plague on TBNG and in eastern Wyoming is now and will continue to affect the ability of the USFS to maintain sizeable acreages of prairie dog colonies. Adverse impacts from plague in conjunction with rodenticide use on a ½ mile buffer adjacent to private land will result in a significant reduction in prairie dog populations.

Prairie dog populations on the TBNG would be reduced by 60- 91%. Rodenticide application will be applied to prairie dog colonies within ½ mile of adjacent non-federal land (refer to screens, Appendix B3). The effects of this alternative are expected to be detrimental and substantial, and ferret habitat will not be maintained in sufficient amounts or distribution through time.

Summary of ESA Effects Determination by Alternative

Alternatives	Determination for black-footed ferret
Alternative 1	No Effect
Alternative 2	No Effect
Alternative 3	No Effect*
Alternative 4	No Effect
Alternative 5	No Effect

* This alternative would result in long-term adverse effects to potential black-footed ferret habitat and would not provide sufficient habitat to support a self-sustaining population of ferrets in the future.

3.1.1 OTHER FEDERALLY LISTED SPECIES

3.1.1.1 Existing Conditions

The table below (Table 17) is a list of species developed by the U.S. Fish and Wildlife Service (USFWS, 2005) representing all species that are federally listed as Threatened, Endangered, or Proposed for listing, that may occur on TBNG. All of the following species were considered. However, not all species on this list would be affected by this action. Those species outside of any effects of the alternatives (geographically or biologically) will be eliminated from further review.

Table 17: TEP Species or Potential Habitat on Thunder Basin National Grassland

Common Name	Scientific Name	Federal Status[1]	Species Present[2]	Habitat Present[2]	May be Affected by this Action
Black-footed Ferret	*Mustela nigripes*	E	N	Y	Y
Whooping Crane	*Grus americana*	E	M	N	N
Least Tern	*Sternula antillarum*	E	D	N	N

1 – E = Endangered, T = Threatened, C = Candidate
2 – Y = Yes, N = No, U = Unknown, M = Migrant, D = Downstream

3.1.1.2 Environmental Consequences

Whooping crane and least tern were not analyzed further in this document because there is no suitable habitat for these species in the project area.

3.1.2 REGION 2 SENSITIVE SPECIES

3.1.2.1 Existing Conditions

Impacts to additional species identified by the Regional Forester as Sensitive species were considered. Species are classified as Sensitive when they meet one or more of the following criteria: 1) The species is declining in numbers or occurrences, and evidence indicates it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend. 2) The species habitat is declining and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline.

Table 18 lists USFS Region 2 Sensitive species or their habitats that could be affected by this amendment (action). Information was assembled to identify species occurrences and ecological requirements. Information sources included USFS district wildlife observation files, Wyoming Natural Diversity Database (WYNDD) Records (Keinath and Beauvais 2003), Wyoming Game and Fish (WGFD) (Cerovski et al., 2004), Breeding Bird Survey (BBS) data (Sauer et al. 2004) and published research. All sensitive species that may occur on the TBNG were considered. Sage grouse is covered in the MIS section. The following are those species that were carried forward and analyzed in full detail:

Table 18: USFS Region 2 Sensitive Species on Thunder Basin National Grassland Analyzed in detail

Common Name	Scientific Name	Federal Status[1]	Species Present[2]	Habitat Present[3]
black-tailed prairie dog	*Cynomys ludovicianus*	S/MIS	Y	Y (F,B)
swift fox	*Vulpes velox*	S	Y	Y (F,B)
bald eagle	*Haliaeetus leucocephalus*	S	Y	Y (F,B)
ferruginous hawk	*Buteo regalis*	S	Y	Y (F,B)
mountain plover	*Charadrius montanus*	S	Y	Y (F,B)
burrowing owl	*Athene cunicularia*	S	Y	Y (F,B)
chestnut-collared longspur	*Calcarius ornatus*	S	Y	Y (F,B)
McCown's longspur	*Calcarius mccownii*	S	Y	Y (F,B)

1-- S=Sensitive, MIS=Management Indicator Species
2 – Y = Yes, N = No, U = Unknown
3 – N = None, F = Foraging, B = Breeding

Mammals

Black-tailed prairie dog

See discussion and analysis of the black-tailed prairie dog starting on page 71.

Swift Fox (*Vulpes velox velox*): *Species information*.
Swift fox populations occur throughout the northern Great Plains, commonly found in mid-grass and short-grass prairies. They often have dens located on rolling ridge tops, and sometimes near roads. There are often 3-6 young in a litter, usually emerging by the first of June. Swift fox are generally active at night. They eat mostly birds, rabbits, mice, and other small mammals, and are know to eat insects for a good portion of their summer diet (Clark and Stromberg, 1987).

Swift fox in Wyoming are found in shortgrass, mixed-grass, agricultural and sagebrush habitats primarily in the eastern portion of the state (Stephens and Anderson 2005). They are small, carnivores that utilize underground dens throughout the year. They maintain multiple dens in a breeding area and will move kits between dens if they feel there is a threat. They prey on small vertebrates and insects. The primary threats to this species are direct mortality from coyotes (*Canis latrans*) and habitat loss/fragmentation (Stephens and Anderson 2005). Uresk et al. (2003) recommend visual obstruction readings of 11-12 cm near swift fox dens in southwestern South Dakota.

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 452,009 acres of primary habitat occurring on TBNG. There is approximately 68,876 acres of secondary habitat on TBNG.

Birds

Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles are typically associated with aquatic habitats and primarily feed on fish or carrion. Nests are usually constructed in the dominant or co-dominant tree of a stand (Johnsgard 1990). Wintering eagles tend to aggregate at roosting sites, often where food concentrations are higher.

As of August 8, 2007 the bald eagle was removed from the Endangered Species list. Forest Service Manual Policy (R2 Supplement, FSM 2672-11(6)) automatically places a species that has been delisted on the Regional Sensitive Species List.

Cerovski et al. (2004) identify this species as being observed on the TBNG. It is a Level I (Conservation Action) species in the Wyoming Partners in Flight Plan (Nicholoff 2003) and WYNDD lists it as a Species of Concern (SOC) (Keinath et al. 2003).

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 553,000 acres of primary habitat occurring on TBNG. There is approximately 200,000 acres of secondary habitat on TBNG.

Ferruginous hawk (*Buteo regalis*): *Species information.*
This large raptor is found throughout TBNG in appropriate habitat. Nesting locations vary and include trees, ground and manmade structures. Ground nests tend to be on prominent points or rock structures that provide some protection from predation. This species preys on small to medium sized mammals, but will take almost any prey available, including birds and reptiles. Many individuals migrate south of TBNG in the winter, however recent telemetry information shows individual hawks collared on TBNG remain through the winter. The primary threat to ferruginous hawks is the loss and conversion of historically occupied habitat which alters nesting habitat and foraging resource availability (Collins and Reynolds 2005).

Cerovski et al. (2004) identify this species as a confirmed breeder on TBNG. It is a Level I (Conservation Action) species in the Wyoming Partners in Flight Plan (Nicholoff 2003) and WYNDD lists it as a SOC (Keinath et al. 2003).

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 514,904 acres of primary habitat occurring on TBNG, on NFS lands. There is approximately 36,011 acres of secondary habitat on TBNG.

Western burrowing owl (*Athene cunicularia*):
This small owl is dependent on underground burrows for nesting habitat. They are most often associated with prairie dog towns, but can also be found in other isolated underground burrows. Prairie dog towns provide better habitat as they have an abundance of available burrows and they provide a short vegetation profile for predator detection. They are summer residents on TBNG that forage for insects and small vertebrates. McDonald et al. (2005) identify the three primary threats to burrowing owls as habitat loss/fragmentation, anthropogenic sources (human disturbance), and losses on wintering grounds.

In the Great Plains, burrowing owls are strongly associated with colonial, burrowing mammals, particularly the black-tailed prairie dog. Surveys in eastern Colorado identified 423 burrowing owl locations within short- and mixed-grass prairie, 80% of which were located within black-tailed prairie dog colonies (Lantz, 2005). On the TBNG, few burrowing owl nest burrows have been found away from prairie dog colonies.

Both systematic and incidental burrowing owl surveys have been conducted on the TBNG. In 1998, prairie dog colonies on 17 National Grasslands were surveyed for burrowing owl. The percentage of occupied colonies varied from 75% occupied on the Grand River to 16% (11 of 68 colonies) on the TBNG.

In 2005, Lantz (2005) surveyed 73 prairie dog colonies on Thunder Basin private and Forest Service land and found 39 inactive colonies and 34 active colonies. Fifty-seven colonies surveyed were occupied by burrowing owls. Of the occupied nests, 81% were within active prairie dog colonies, and 19% of nests were within inactive prairie dog colonies. In 2003 and 2004 Lantz identified a total of 136 active burrowing owl nest burrows (Lantz, 2005).

Cerovski et al. (2004) identify this species as a confirmed breeder on TBNG. It is a Level I (Conservation Action) species in the Wyoming Partners in Flight Plan (Nicholoff 2003) and WYNDD has it listed as a SOC (Keinath et al. 2003).

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 494,205 acres of primary habitat occurring on TBNG. There is approximately 46,529 acres of secondary habitat on TBNG.

Mountain plover (*Charadrius montanus*)
This small shorebird is a summer breeder on TBNG and is most often found in prairie dog towns where the shortgrass habitat it prefers is maintained. Appropriate nesting habitat is shortgrass areas with approximately 30% bare ground, and they tend to avoid areas near water sources (Dinsmore 2003). They construct a shallow scrape nest on the ground. They winter in central California into northern Mexico. Dinsmore (2003) identifies loss of native habitat, including prairie dog colonies, as the primary threat to mountain plover.

Mountain plover nesting normally occurs in short vegetation types or areas routinely kept short. While they will nest in playas, roads, and recent burn areas, much of this available literature indicate that a significant portion of the summer habitat is associated with prairie dogs. On Thunder Basin National Grassland, over half of the known nests have been found in black-tailed prairie dog colonies (Plumb, 2004).

Cerovski et al. (2004) identifies this species as occurring on TBNG. It is a Level I (Conservation Action) species in the Wyoming Partners in Flight Plan (Nicholoff 2003) and WYNDD has it listed as a SOC (Keinath et al. 2003).

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 281,897 acres of primary habitat occurring on TBNG. There is approximately 40,163 acres of secondary habitat on TBNG.

McCown's longspur (*Calcarius mccownii*)
McCown's longspurs breed from southern Alberta and southern Saskatchewan, south through Montana, eastern and central Wyoming, and north central Colorado, and east to western Nebraska, north central South Dakota and southwestern North Dakota (Dechant et al. 2003d). This species is a common summer resident of the Eastern Plains and Great Basin-foothills

grasslands, basin-prairie shrublands, and agricultural areas throughout most of Wyoming (Cerovski et al. 2004). Specifically, this species requires open habitats such as sparsely vegetated, low structured grasslands and heavily grazed pastures containing a moderate bare ground component for nesting and foraging.

This species is found in shortgrass habitats such as prairie dog towns. They are summer breeders on TBNG and they winter in Texas and Oklahoma (Sedgwick 2004b). They are a ground nesting species that forages for insects and seeds. The primary threat to this species is the loss of native shortgrass prairie habitat (Sedgwick 2004b).

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 154,301 acres of primary habitat occurring on TBNG, on NFS lands. There is approximately 15,803 acres of secondary habitat on TBNG.

Chestnut-collared longspur (*Calcarius ornatus*)
Chestnut-collared longspurs are summer breeders on TBNG in areas of shortgrass and mixed-grass habitat. Wintering habitat is the southwest United States into Texas. They are a ground nesting passerine that forages for insects and seeds. The primary threat to this species is habitat loss and conversion (Sedgwick 2004a).

Cerovski et al. (2004) identify this species as being observed in the vicinity, but with no confirmed breeding activity. It is a Level II (Monitoring) species in the Wyoming Partners in Flight Plan (Nicholoff 2003) and WYNDD lists it as a SOC (Keinath et al. 2003).

Wyoming GAP information (University of Wyoming, 1996) indicates there is potentially 60,356 acres of primary habitat occurring on TBNG, on NFS lands. There is approximately 7,914 acres of secondary habitat on TBNG.

3.1.2.2 Environmental Consequences

3.1.2.2.1 Alternative 1-No Action

Direct and Indirect Effects
This alternative is based on the 2001 LRMP current prairie dog management on the National Grassland which did not set specific maximum acreage objectives or limits for prairie dogs. The current management objective for prairie dogs located on Thunder Basin National Grassland is to manage populations using non-lethal methods and to limit rodenticide use to situations where human health and safety or infrastructure is threatened.

Most of the biological determinations under Alternative 1 are taken from the Biological Assessment and Evaluation for the revised LRMP (Appendix H in the LRMP FEIS), since Alternative 1 prescribes the prairie dog direction in the revised LRMP. The only new analyses for Alternative 1 are for the newly designated sensitive species. The impacts for bald eagle, black-tailed prairie dog and mountain plover are also discussed in the LRMP (Appendix H in the LRMP FEIS). Since the LRMP analysis, the bald eagle has been removed from the Federal list and the mountain plover and black-tailed prairie dog are no longer candidates under ESA.

Effects Determination

This alternative **May adversely impact individuals**, but is not likely to result in a loss of viability on the planning unit, nor cause a trend to federal listing or a loss of species viability range-wide for sensitive species (MAIINL).

Species	Determination	Rationale
black-tailed prairie dog	MAIINL	Habitat availability and quality will remain the same as the LRMP.
swift fox	MAIINL	Habitat availability and quality will remain the same as the LRMP.
bald eagle	MAIINL	Habitat availability and quality will remain the same as the LRMP.
ferruginous hawk	MAIINL	Habitat availability and quality will remain the same as the LRMP.
mountain plover	MAIINL	Habitat availability and quality will remain the same as the LRMP.
burrowing owl	MAIINL	Habitat availability and quality will remain the same as the LRMP.
chestnut-collared longspur	MAIINL	Habitat availability and quality will remain the same as the LRMP.
McCown's longspur	MAIINL	Habitat availability and quality will remain the same as the LRMP.

3.1.2.2.2 Direct and Indirect Effects Common to All Action Alternatives

Zinc phosphide is highly toxic to wild birds. It is also toxic to non-target mammals. Nearly sixty studies have been conducted on the toxicity of this rodenticide to wild animals (USFS, 2007b). The most sensitive bird species which have been evaluated are geese, pheasants, mourning doves, quail, mallard ducks and the horned lark are also very susceptible to this compound. The seed eating animals of TGNB will be at risk of being poisoned by the zinc phosphide treated oats that could be applied as a result of proposed actions (USFS, 2007b). However, rodenticide will not be used from January 1 through September 30 as directed in the plan, which should minimize this risk to migratory birds.

Results of studies generally indicate that zinc phosphide, when applied by label directions, poses little secondary risk to non-target wildlife. Zinc phosphide breaks down rapidly in the digestive tract of affected animals, so predators and scavengers are generally not exposed to the compound (USFS, 2007b).

Bald eagles could be exposed to the zinc phosphide treated grain. They are not a granivorous species so direct consumption of the treated grain is not expected. They are known to feed on carrion (USFS, 2007b), so consumption of prairie dogs that have been poisoned is a possibility. This threat is lessened, because most prairie dogs poisoned with zinc phosphide treated grains die inside their burrows. Incidental contact with crews applying rodenticide may disturb the birds temporarily, but they should not be displaced for long from foraging areas on prairie dog colonies.

Short grass/bare ground habitat provided by prairie dog colonies for the two longspur species and mountain plover could be reduced by using rodenticide. These effects are expected to be minimal because use of rodenticide will be limited in its use and duration, and only for special circumstances (refer to decision screens, Appendix B). Other management tools such as grazing could be used to offset the adverse impacts from reduction of prairie dog colony habitat.

Prairie dog burrows create a unique habitat for other creatures, including burrowing owls, badgers, rabbits, black-footed ferrets, snakes, salamanders, and insects. Without live prairie dogs

to maintain the burrow system, the burrows will deteriorate. Within a few years the burrow system breaks down, and its value to other wildlife is reduced. The Forest Service sensitive species that uses the prairie dog burrow systems is the burrowing owl.

3.1.2.2.3 Direct and Indirect Effects Common to Alternatives 2, 4, and 5

There will be no direct effects to bald eagles from any action alternative. There will be no direct mortality of bald eagles from rodenticide use. There will be very minimal disturbance to habitat, since rodenticide use will located in prairie dog colonies, which are generally located outside most eagle habitat. Those colonies that could potentially be poisoned are located outside bald eagle habitat, and aren't used for foraging by bald eagles on the Grassland, because of the lack of water and large perch trees.

All species analyzed could be potentially affected by using rodenticide in any prairie dog colonies outside of the MA 3.63. Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens, Appendix B), any colony that is poisoned may be used as habitat by all species.

With this alternative, there will be an increase in human activities, disturbance, and increased noise levels, and loss of prairie dog habitat, but it would be on a limited basis and limited time frame. Therefore, the affects are expected to be minimal.

There will no impact to available suitable habitat for prairie dogs, because all rodenticide use would occur only on active colonies. There is potential for translocation of prairie dogs on towns identified for treatment to be moved to nearby vacant suitable habitat (unoccupied prairie dog colonies). All translocation would have to be approved by WGFD.

It is expected that there will be minimal impacts to available suitable habitat for those species that occupy prairie dog colony habitat. These species will likely avoid the area being treated for the duration of the project activities. Other species of small mammals will likely make use of vacant burrows and provide forage for Ferruginous hawks, swift fox, and burrowing owls.

Since rodenticide use will be limited, there should be little impact to eagles. Also, rodenticide application would be outside the breeding season therefore disturbance should be minimal.

3.1.2.2.4 Alternative 2-Proposed Action

Direct and Indirect Effects

All species analyzed are not expected to be adversely impacted by adjusting the MA 3.63 boundary. Changing the MA 3.63 boundary is expected to have beneficial effects by including more existing prairie dog colonies and potential prairie dog habitat. The modified MA 3.63 will be approximately the same size as the current MA 3.63, therefore there is not a loss of acreage for the Ferret Reintroduction habitat. By increasing the MA 3.63, more prairie dogs colonies are protected from lethal control than currently. This will provide more habitat and protection for those species that use prairie dog towns.

Lower amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions and provide suitable habitat conditions for associated species. The current and future CCAAs will provide for some protection of prairie dogs and these habitat conditions on private. The current recreational shooting prohibition in MA 3.63 and that proposed for the NFS lands in Category 2 areas may help to minimize accidental or intentional killing of other species associated with prairie dogs in those areas, and minimize disturbance to breeding pairs. This shooting restriction will be adjusted to include the proposed ferret reintroduction habitat. All other colonies on the TBNG would be exposed to this activity.

Effects Determination

This alternative will result in a "**May Adversely Impact Individuals, But Is Not Likely To Result in A Loss of Viability in the Planning Area, Nor Cause A Trend Toward Federal Listing"** determination (MAIINL).

Species	Determination	Rationale
black-tailed prairie dog	MAIINL	Rodenticide/Reduced habitat availability.
swift fox	MAIINL	Reduced denning and foraging habitat quality.
bald eagle	MAINL	Altered prey availability.
ferruginous hawk	MAIINL	Altered prey availability.
mountain plover	MAIINL	Reduced nesting habitat quality.
burrowing owl	MAIINL	Reduced nesting, foraging, and brood rearing habitat availability.
chestnut-collared longspur	MAIINL	Reduced foraging habitat availability.
McCown's longspur	MAIINL	Reduced nesting, foraging, and brood rearing habitat availability

3.1.2.2.5 Alternative 3-Boundary Management

Direct and Indirect

The characteristics of Thunder Basin National Grassland would be changed through the implementation of this alternative by increasing human activities, human disturbance, and increased noise levels associated with rodenticide use activities, and loss of 77% of all prairie dog habitat. Rodenticide use will take place every year in the same area to maintain the ½ mile buffer around all NFS land that neighbors private land.

All species analyzed are expected to be adversely impacted by using rodenticide within a half mile of every piece of NFS land on Thunder Basin National Grassland inhabited by prairie dogs.

Not only would this alternative reduce the number of acres of prairie dog colonies, but it would also limit the spatial distribution of colonies by consolidating them to only a few places on TBNG. This would limit the ability to manage prairie dogs across the planning unit, and in turn would adversely impact the viability of the species across the planning unit, and any species associated with prairie dog colonies.

This action is expected to have some adverse impacts on bald eagles because it would be detrimental and substantial, and bald eagles and their habitat will not be maintained in sufficient numbers or distribution through time. This action would decrease bald eagle habitat, by decreasing the prey base and foraging habitat.

Lower amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions and provide suitable habitat conditions for associated species. The current recreational shooting prohibition in MA 3.63 and that proposed for the NFS lands in Category 2 areas may help to minimize accidental or intentional killing of other species associated with prairie dogs in those areas, and minimize disturbance to breeding pairs. All other colonies on the TBNG would be exposed to this activity.

All associated sensitive species would be adversely impacted by this alternative. Not only would the prairie dog population be reduced by almost 90%, but any sensitive or T&E species that utilizes prairie dog colonies for its survival would be impacted. There would be decreased forage for many of the prey species (Ferruginous hawks, etc.) and there would be a decrease in the short grass/bare ground component that is required by plover, longspurs, etc. The effects of this alternative are expected to be detrimental and substantial, and the species analyzed and their habitats will not be maintained in sufficient numbers nor will they be well-distributed over the planning unit through time.

Effects Determination

This alternative will result in a **"May Adversely Impact Individuals, Likely to result in a loss of viability in the Planning Area, or in a trend toward federal listing"** determination (MAIINL)**.**

Species	Determination	Rationale
black-tailed prairie dog	MAIIL	Significant population reduction due to Rodenticide/Loss of habitat availability.
swift fox	MAIIL	Loss of denning and foraging habitat.
bald eagle	MAIIL	Loss of prey availability.
ferruginous hawk	MAIIL	Loss of prey availability.
mountain plover	MAIIL	Loss of nesting habitat.
burrowing owl	MAIIL	Loss of habitat.
chestnut-collared longspur	MAIIL	Loss of habitat.
McCown's longspur	MAIIL	Loss of habitat.

3.1.2.2.6 Alternative 4-Adjusted Management Area and Limited Rodenticide Use

Direct and Indirect Effects

All species analyzed could be potentially affected by using rodenticide in any prairie dog colonies outside of the MA 3.63. Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens Appendix B4), any colony that is poisoned may be used as habitat by all species. The limitation of rodenticide to no more than 5% of the active prairie dog acres should decrease some of the impact. Based on existing data, the 5% cap should eliminate rodenticide use in some years due to the facts that annual population growth is sometimes less than 5%. This means that in some years no rodenticide would be used, even under those special circumstance described in the decision screen.

This alternative will also emphasize the use of other non-lethal tools, more specifically translocation, which in turn will reduce the amount of rodenticide use needed to control colonies that are in conflict with other uses. Relatively high amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions and provide suitable habitat conditions for associated species. The current recreational shooting prohibition in MA 3.63 and those proposed for all NFS lands, except for those colonies identified for lethal control may help to minimize accidental or intentional killing of other species associated with prairie dogs in those areas, and minimize disturbance to breeding pairs.

Effects Determination

This alternative will result in a "**may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing"** determination (MAIINL).

Species	Determination	Rationale
black-tailed prairie dog	MAIINL	Rodenticide/Reduced habitat availability.
swift fox	MAIINL	Reduced denning and foraging habitat quality.
bald eagle	MAINL	Altered prey availability.
ferruginous hawk	MAIINL	Altered prey availability.
mountain plover	MAIINL	Reduced nesting habitat quality.
burrowing owl	MAIINL	Reduced nesting, foraging, and brood rearing habitat availability.
chestnut-collared longspur	MAIINL	Reduced foraging habitat availability.
McCown's longspur	MAIINL	Reduced nesting, foraging, and brood rearing habitat availability

3.1.2.2.7 Alternative 5-Additional Category 2 Areas

Direct and Indirect Effects

All species analyzed are not expected to be adversely impacted by adjusting the MA 3.63 boundary. Changing the MA 3.63 boundary is expected to have positive effects, by including more existing prairie dog colonies and potential prairie dog habitat. The proposed MA 3.63 will be approximately the same size as the current MA 3.63, therefore there is not a loss of acreage for the Ferret Reintroduction habitat. By changing the MA 3.63, more prairie dogs colonies are protected from lethal control than they are currently. This will provide more habitats for those species that use prairie dog colonies, and are protected.

Lower amounts of expected use of prescribed burning and prescribed grazing may be used to enhance prairie dog habitat conditions and provide suitable habitat conditions for associated species. The current and future CCAAs will provide for some protection of prairie dogs and these habitat conditions on private. The current recreational shooting prohibition in MA 3.63 and that proposed for the NFS lands in Category 2 areas may help to minimize accidental or intentional killing of other species associated with prairie dogs in those areas, and minimize disturbance to breeding pairs. All other colonies on the TBNG would be exposed to this activity.

Effects Determination

This alternative will result in a "**may adversely impact individuals, but is not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing"** determination for sensitive species (MAIINL).

Species	Determination	Rationale
black-tailed prairie dog	MAIINL	Rodenticide/Reduced habitat availability.
swift fox	MAIINL	Reduced denning and foraging habitat quality.
bald eagle	MAINL	Altered prey availability.
ferruginous hawk	MAIINL	Altered prey availability.
mountain plover	MAIINL	Reduced nesting habitat quality.
burrowing owl	MAIINL	Reduced nesting, foraging, and brood rearing habitat availability.
chestnut-collared longspur	MAIINL	Reduced foraging habitat availability.
McCown's longspur	MAIINL	Reduced nesting, foraging, and brood rearing habitat availability

Cumulative Effects Common to All Alternatives

Cumulative effects from past, present and future grazing, range improvements, oil and gas development, motorized and dispersed recreation, recreational shooting, plague and use of rodenticides on private lands will be similar to those described under Section 3.1.2, Cumulative Effects-All Alternatives (page 100).

Cumulative Effects Common to Alternatives 1, 2, 4, and 5

The loss of prairie dog colonies on private and state land necessitates large areas of federal land to support prairie dog colonies for black-footed ferret habitat. The overall impacts from control of prairie dogs on private lands would result in a lower prey base due to lack of prairie dogs, and therefore reduce the potential for ferret habitat.

Shooting prairie dogs in colonies that have been previously poisoned could likely prevent or slow population recovery in those colonies. Also, gunfire and other related activity and disturbances may disrupt prairie dog foraging and other activities for extended periods of time. Prairie dogs exhibit different behavioral patterns in colonies where shooting occurs compared to colonies where there is no shooting. There is a shooting restriction already in place on TBNG that protects from shooting 72,500 acres of prairie dog habitat. This shooting restriction also includes the ferret reintroduction habitat currently identified in the plan. Shooting may also pose a mortality risk to including burrowing owls, mountain plover, ferruginous hawks, swift fox, and other sensitive species.

The presence of plague on Thunder Basin National Grassland is and will continue to affect the ability of the USFS to maintain acreages of prairie dog colonies suggested in any of the alternatives, and in the Prairie Dog Management Strategy. Adverse impacts from plague resulting in a reduction of prairie dog acreages could impact some sensitive species including the black-tailed prairie dog, burrowing owls, mountain plover, McCown's longspur, chestnut-collared longspur, Ferruginous hawk, and swift fox.

Prairie dog populations on NFS lands of the TBNG will be managed to maintain viability and provide habitat for other species that depend upon prairie dog colonies.

Rodenticide will not be applied if the population viability of other species dependent upon prairie dog habitat is in question. Rodenticide will only be applied under very specific circumstances (refer to screen) in such a way that conflict with other uses is decreased, while maintaining or increasing populations to a level habitat for other species is maintained.

Cumulative Effects-Alternative 3
Shooting prairie dogs in colonies that have been previously poisoned on this large of scale would likely prevent population recovery in those colonies. Also, gunfire and other related activity and disturbances may disrupt any surviving prairie dogs foraging and other activities for extended periods of time. Prairie dogs exhibit different behavioral patterns in colonies where shooting occurs compared to colonies where there is no shooting.

The presence of plague on Thunder Basin National Grassland is and will continue to affect the ability of the USFS to maintain acreages of prairie dog colonies. Adverse impacts from plague in conjunction with rodenticide use on a ½ mile buffer system, will result in a reduction of prairie dog acreages and adversely impact sensitive species analyzed.

Cumulative Effects Summary
Cumulative Effects from Alternative 1-No Action are expected to be lower than Alternative 4-Adjusted management area and limited rodenticide use, which is lower than Alternative 5-Additional category 2 areas, which is lower than Alternative 2-Proposed action due to higher expected use of rodenticide on private lands within the analysis area. Alternative 3 would have the greatest adverse cumulative effects due to anticipated rodenticide use on both federal and private lands.

Summary of Effects to Forest Service Sensitive Species:

Common Name	Alternative 1	Alternative 2,	Alternative 3	Alternative 4	Alternative 5
black-tailed prairie dog	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
swift fox	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
bald eagle	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
ferruginous hawk	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
mountain plover	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
burrowing owl	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
chestnut-collared longspur	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL
McCown's longspur	MAIINL	MAIINL	MAIIL	MAIINL	MAIINL

3.1.3 MANAGEMENT INDICATOR SPECIES (MIS)

3.1.3.1 Existing Conditions

As a part of the development of the Land and Resource Management Plan for The Thunder Basin National Grassland (2002), Management Indicator Species (MIS) were identified. MIS are those species for which habitat and population trends are monitored to determine the effects of

management. LRMP Management Indicator Species (MIS) are black-tailed prairie dog, sage grouse and sharp-tailed grouse. Sharp-tailed grouse occur in only a few locations on the Grassland, and occupy the same type as sage grouse, so they are analyzed together in the effects analysis.

Sage grouse is an MIS for all Geographic Areas (GAs) identified in the LRMP. Black-tailed prairie dogs are an MIS for the following GA's: Broken Hills, Cellers Rosecrans. Sharp-tailed Grouse are an MIS for the following GA's: Spring Creek, Upton Osage.

The TBNG harbors part of one of the seven major prairie dog colony complexes remaining in North America. Black-tailed prairie dogs are highly social, diurnal burrowing rodents that typically feed on grasses and forbs. Prairie dogs form colonies that are the main unit of a prairie dog population. This species has the ability to rapidly expand its distribution and population if not limited by pest control practices or disease, and will readily spread into recently disturbed areas. Many species such as the black-footed ferret, mountain plover (*Charadrius montanus*), burrowing owl (*Athene cunicularia*), and swift fox are dependent on prairie dogs during a portion of their life cycle. Black-tailed prairie dog occupied range and abundance has declined dramatically throughout the country, and continues to exhibit a slow decline. Major factors contributing to the decline include disease (sylvatic plague), urbanization, habitat conversion, and control efforts.

The sage grouse is a R2 sensitive species and a Management Indicator Species on Thunder Basin National Grassland. Sage grouse (*Centrocercus urophasianus)* is the largest grouse in North America. It is a sagebrush obligate, and is entirely dependent on sagebrush ecosystems. This species is considered a "landscape species" (Wyoming Sage Grouse Working Group 2003) because it utilizes a variety of sagebrush structural stages to meet seasonal habitat requirements. Mating birds aggregate on leks (display grounds) which are generally bare or grassy patches within larger sagebrush stands. Nesting habitat for females is denser sagebrush that provides hiding cover and is often 2-3 miles from the lekking grounds. Juvenile grouse feed on forbs and insects and are often found in wetter riparian areas. In winter this species specializes on sagebrush that is available above the snow.

Sharp-tailed grouse (*Tympanuchus phasianellus*) habitat requirements are the open-lands of grassland and prairies. Sagebrush, and other shrub/brush species, provides critical winter shelter and food source. The ROD for the LRMP was signed in August of 2002 designating sharp-tailed grouse as an MIS for the Upton Osage GA. Sharp-tailed grouse information has been collected by USFS personnel on the TBNG since 2003.

Population Analysis

Prairie Dog: This prairie dog evaluation system is based on the number of active burrows per hectare in active prairie dog towns. Prairie dog towns must be accurately mapped on 1:24,000 maps as the first step. Transects are then laid out in the longest direction of the town on the map within each prairie dog town. Transects are numbered on the map and in the accompanying field notebook - for each prairie dog town. Transects are 200 meters apart and can be split and

wrapped around if the edge of the prairie dog town is reached before the transect is completed. Complete coverage of each prairie dog town is the goal.

Sage and Sharp-tailed Grouse: In developing the trend analysis, we used the same equations used by (WGFD) up until 2004, so that we could directly compare our results with the state and regional trends. A population estimate for a lek complex is made by taking the peak male attendance and multiplying by two females for each male observed. The population estimate is derived from the average complex population times the total number of known complexes. Population estimates should represent the minimum population levels because not all lek complexes within the TBNG have been documented. As more complexes are identified, the accuracy of the population estimate may improve.

The newer method for estimating population trend is by calculating mean males per lek. This is the new protocol being used by the WGFD and has been adopted by the local sage grouse working groups across the state of Wyoming. Results from both types of analysis are displayed below in the graphs below.

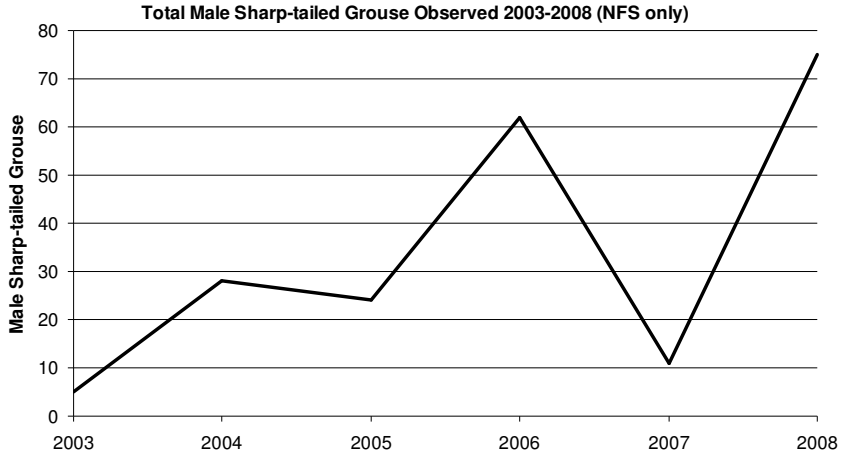
Population Data

Black-Tailed Prairie Dog:

See discussion and analysis of the black-tailed prairie dog starting on page 71.

Sharp-tailed grouse - Since the designation of sharp-tailed grouse as an MIS for Upton Osage GA, surveys have been conducted annually with increasing effort. Lek observation information is presented in Wildlife Report. (Lockman, 2007) There has been an increase in numbers from 2002 to 2008.

Figure 17: Sharp-Tailed Grouse Population Estimates on TBNG



Sage Grouse - When looking at the population estimate of sage grouse, the following graphs show that the population estimate has increased across the Thunder Basin National Grassland from 2003 to present.

Figure 18: Sage Grouse Average Males Per Lek

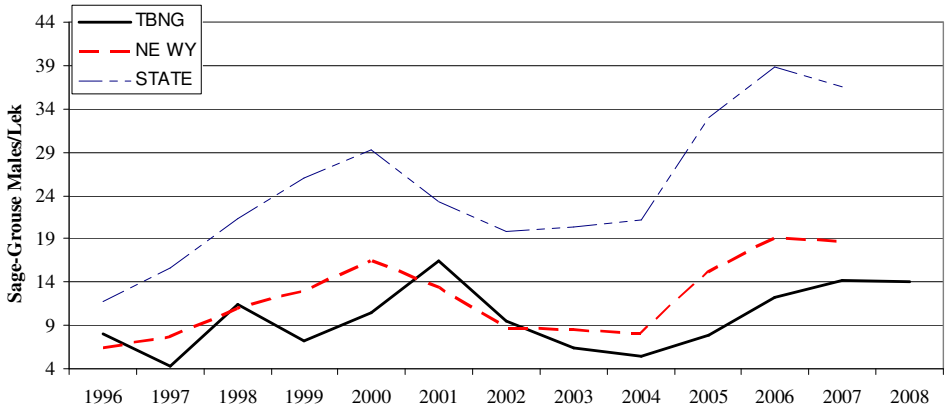


Figure 19: Sage Grouse Population Estimates

Geographic Area Males/Lek

Mean sage-grouse males/lek analysis was performed for all Geographic Areas that currently hold sage-grouse. Currently five of the six geographic area on TBNG have sage-grouse leks on NFS land. The Upton-Osage Geographic Area has historic sage-grouse leks, but none on NFS land. This area has been searched for the past three years and no leks have been found. It is important to remember that annual variation in each Geographic Area can be substantial due to the small sample size and that the calculations are only for leks on NFS lands and not those leks on other surface. The exclusion of leks on private surface makes some Geographic Areas artificially low. For comparison purposes annual males/lek was compared to the ten-year mean for each Geographic Area.

Table 19: 2006 Greater sage-grouse lek statistics by Geographic Area

Geographic Area	Total Leks	Abandoned/ Destroyed Leks	Leks Checked	Active Leks	Percentage of TBNG leks in each GA
Broken Hills	5	0	5	4	14.7
Cellar Rosecrans	10	0	8	7	29.4
Fairview Clareton	7	1	5	1	20.6
Hilight Bill	7	3	4	1	20.6
Spring Creek	5	1	5	1	14.7

Broken Hills
In 2006 there were 18.8 sage-grouse males/lek in this Geographic Area which is a 100% increase from 2005 (9.4 males/lek). The 2006 average is the highest males/lek over the 10 year period for this Geographic Area and is above the ten-year mean of 10.8 sage-grouse males/lek.

Cellar Rosecrans
In 2006 there were 22.6 sage-grouse males/lek which was a 31% increase from 2005 (17.2 males/lek). Sage-grouse observation information for this Geographic Area goes back to 1999. The highest males/lek for this Geographic Area was in 2001, but 2006 is the second highest. This Geographic Area is above the ten-year mean of 17.3 sage-grouse males/lek.

Fairview Clareton
In 2006 there were 8.6 sage-grouse males/lek in this Geographic Area which is a 20% decrease from 2005 (10.7 sage-grouse males/lek). The highest males/lek for this Geographic Area was in 1998 and 1999 with 16 sage-grouse males/lek. This Geographic Area is currently below the ten-year mean of 9.9 sage-grouse males/lek. Males/lek for this Geographic Area was adversely affected by the removal of the Dunham 9 lek which was determined to be on private land. This lek had 71 birds in 2006 which would have increased males/lek for this area.

Hilight Bill
There are seven leks that have ever been documented on NFS land in this Geographic Area and three are classified as abandoned or destroyed generally caused by coal mining activity. At this time there are four leks that are still considered active on NFS land in this Geographic Area. In 2006 there were 2.5 sage-grouse males/lek which is an increase from 2005 (2.0 sage-grouse males/lek). This Geographic Area is currently below the ten-year mean of 3.8 sage-grouse males/lek.

Spring Creek
The Spring Creek Geographic Area had 3.2 males/lek, which is higher than 2005 (2.6 males/lek). Calculations for 2006 are different than previous years because of two changes. The first is the inclusion of the Bergreen lek which is on private surface, but was originally on NFS land. Land status changed during the Boardman Land Exchange. The second is the ZV Creek II lek was in the WGFD spreadsheet as on NFS land but is actually on private surface so this was removed from the calculation. This Geographic Area is currently below the 10 year average of 5.0 sage-grouse males/lek.

Minimum Population Estimate
Although the 2008 minimum population estimate is higher than it has been in a while, there are cautions when interpreting this information. Because of inconsistent survey effort these estimates are useful in looking at long-term (10-20 year) trends. Not much can be interpreted from annual variation because slight increases in effort can skew estimates. At this time the sage-grouse population appears to be increasing on TBNG.

TBNG Males/Lek
Sage-grouse males/lek for TBNG was the second highest in ten-years. This also indicates and increasing population, but it has only been in the past five years that lek survey efforts are monitoring enough leks to get an accurate picture.

Geographic Areas
It is hard to interpret the sage-grouse males/lek for each Geographic Area because some of the areas have 4-5 leks. The exclusion of private lands leks also skews the calculations. Given the proximity of some of those private leks to NFS land, the public land is supplying nesting and brood rearing habitat that is supporting those private leks.

There are two Geographic Areas above the ten-year mean of sage-grouse males/lek and three below. The Broken Hills and Cellar Rosecrans are above while the Fairview Clareton, Hilight Bill and Spring Creek Geographic Areas are below ten-year mean. With the exception of the Fairview Clareton Geographic Area the sage-grouse males/lek increased in all other Geographic Areas from 2005.

3.1.3.2 Environmental Consequences

Black-Tailed Prairie Dog
See discussion and analysis of the black-tailed prairie dog starting on page 71.

3.1.3.2.1 Alternative 1-No Action

Current management is maintaining viable populations and habitat conditions

Planned and managed activities anticipated with this alternative (as described above) may temporarily modify existing grassland vegetation conditions Changes in current vegetation conditions would be temporary and generally minor, and therefore should not decrease suitable habitat for sensitive species, and overall habitat conditions would be consistent with LRMP objectives.

3.1.3.2.2 Alternative 2-Proposed Action

Prairie dog populations are not expected to be adversely impacted by adjusting the MA 3.63 boundary. Modifying the MA 3.63 boundary is expected to have beneficial effects, by including more existing prairie dog colonies and potential prairie dog habitat. By changing the MA 3.63, more prairie dogs colonies are protected from lethal control than are currently. This may result in slightly higher prairie dog acreage over the life of the LRMP.

The characteristics of the area may be changed through the implementation of this alternative by increasing human activities, disturbance, and increased noise levels, and loss of prairie dog habitat. But it would be on a limited basis and limited time frame, and therefore the affects are expected to be minimal. There will no impact to available suitable habitat for prairie dogs, because all rodenticide use would occur only on active colonies.

3.1.3.2.3 Alternative 3-Boundary Management

The characteristics of Thunder Basin National Grassland would be changed through the implementation of this alternative by increasing human activities, human disturbance, and increased noise levels, and loss of 60-91% of all prairie dog habitat. The estimated population trend would be sharply downward and a viable population could not be sustained.

3.1.3.2.4 Alternative 4 -Adjusted Management Area and Limited Rodenticide Use

Prairie dogs could be potentially affected by using rodenticide in any colonies outside of the MA 3.63. The limitation of rodenticide to no more than 5% of the active colony acres should decrease some of the impact. The adverse impacts associated with rodenticide use would be minimal.

Similar to Alternatives 2 and 5, there will be an increase human activities, disturbance, and increased noise levels, and loss of prairie dog habitat. But it would be on a limited basis and limited time frame, and therefore the affects are expected to be minimal. There will no impact to available suitable habitat for prairie dogs, because all rodenticide use would occur only on active colonies.

3.1.3.2.5 Alternative 5-Additional Category 2 Areas

The proposed MA 3.63 will be approximately the same size as the current MA 3.63, therefore there is not a loss of acreage for the Ferret Reintroduction habitat. By changing the MA 3.63 and adding more category 2 areas, more prairie dogs colonies are protected from lethal control than they are currently.

Similar to Alternatives 2 and 4, there will be an increase human activities, disturbance, and increased noise levels, and loss of prairie dog habitat. But it would be on a limited basis and limited time frame, and therefore the affects are expected to be minimal. There will no impact to available suitable habitat for prairie dogs, because all rodenticide use would occur only on active colonies.

Cumulative Effects Common to All Alternatives

Cumulative effects from past, present and future grazing, range improvements, oil and gas development, motorized and dispersed recreation, recreational shooting, plague and use of rodenticides on private lands will be similar to those described under Section 3.1.2, Cumulative Effects-All Alternatives (page 100).

Cumulative Effects-Alternatives 1, 2, 4, and 5

It is possible that conflict with the private lands located within TBNG will continue under this alternative. Currently, there are approximately 800 to 1,100 acres of prairie dog colonies that

are a source of conflict between neighboring private lands. These conflicts would likely continue with Alternative 1 and would be reduced in varying levels in Alternatives 2, 4, and 5.

Although current population trend shows a decline, this is due to the presence of sylvatic plague and not USFS management. Populations may continue to show fluctuations, but this is to be expected during a plague epizootic. Current management goals are to show a stable to increasing population of prairie dogs and wider distribution of colonies. With these alternatives, future efforts will be implemented to reach the goals and objectives described in the LRMP for prairie dogs.

Although populations are showing some level of decrease, on average it is increasing from historic lows (when plague first appeared). Spatial distribution of the colonies is wider, which reduces potential impacts from plague. These alternatives are not expected to affect this trend.

Therefore, based on the direct, indirect, and cumulative impacts associated with these alternatives, the prairie dog populations will remain viable across the planning unit.

Cumulative Effects-Alternative 3

The presence of plague on Thunder Basin National Grassland is and will continue to affect the ability of the USFS to maintain acreages of prairie dog Colonies. Adverse impacts from plague in conjunction with rodenticide use on a ½ mile buffer system will result in a reduction of prairie dog acreages and adversely impact any species that use prairie dog colonies as habitat.

The prairie dog population would be reduced by almost 60-91% (refer to map in appendix. This alternative, in conjunction with plague, shooting, and other adverse impacts to prairie dog colonies, would cause a downward trend in the prairie dog population. The effects of this alternative are expected to be detrimental and substantial, and prairie dogs and their habitat will not be maintained in sufficient numbers or distribution through time.

Not only would this alternative reduce the number of acres of prairie dog colonies, but it would also limit the spatial distribution of colonies by consolidating them to only a few places on TBNG. This would limit the ability to manage prairie dogs across the planning unit, and in turn would adversely impact the viability of the species across the planning unit, and any species associated with prairie dog colonies.

Although current population trend shows a decline, this is due to the presence of sylvatic plague and not USFS management. But if rodenticide treatment occurs within a ½ mile buffer around all NFS land, the population trend will show a drastic decrease, and viability will not be maintained. With this alternative, these current LRMP goals and objective would not be reached. Implementation of this particular alternative is not compatible with the direction and scope of other decisions regarding management within the analysis area in the past.

Therefore, based on the direct, indirect, and cumulative impacts associated with this alternative, the prairie dog populations will not remain viable across the planning unit.

Sage Grouse and Sharp-Tailed Grouse

3.1.3.2.1 Alternative 1-No Action

Direct and Indirect Effects
There will be no direct effects to sage grouse and sharp-tailed grouse from this alternative. There will be no direct mortality of grouse. There are no anticipated adverse effects to the grouse species considered because current management is maintaining viable populations and habitat conditions.

3.1.3.2.2 Alternative 2-Proposed Action

Direct and Indirect Effects
Under this alternative, there will be little change in expected population and habitat trends of these two MIS. There will be no increase in raptor predation of grouse, as few perches will be created. There will be very minimal disturbance to habitat, since rodenticide use will located in prairie dog colonies, which are generally located outside most grouse habitat. And since rodenticide use will be limited, there should be little impact to grouse. Also, rodenticide application would be outside the breeding season therefore disturbance should be minimal.

3.1.3.2.3 Alternative 3-Boundary Management

Direct and Indirect Effects
The characteristics of Thunder Basin National Grassland would be changed through the implementation of this alternative by increasing human activities, disturbance, and increased noise levels, and loss of 60-91% of all prairie dog habitat. Both sage grouse and sharp-tailed grouse on TBNG require short grass habitat types for lekking (dancing grounds), which are most often provided by prairie dog colonies. By removing most of the prairie dog population on TBNG, the current habitat type maintained by this species would be drastically reduced. This in turn may change habitat conditions across TBNG.

3.1.3.2.4 Alternative 4-Adjusted Management Area and Limited Rodenticide Use

Direct and Indirect Effects
There will be no direct effects to sage grouse and sharp-tailed grouse from this alternative. There will be no direct mortality of grouse and there will be no increase in raptor predation of grouse, as few perches will be created. There will be very minimal disturbance to habitat, since rodenticide use will located in prairie dog colonies, which are generally located outside most grouse habitat. And since rodenticide use will be limited, there should be little impact to grouse. Also, rodenticide application would be outside the breeding season therefore disturbance should be minimal.

Expected population and habitat trend would increase as predicted under the 2002 LRMP.

3.1.3.2.5 Alternative 5-Additional Category 2 Areas

Direct and Indirect Effects
There will be no direct effects to sage grouse and sharp-tailed grouse from this alternative. There will be no direct mortality of grouse and there will be no increase in raptor predation of grouse, as no perches will be created. There will be very minimal disturbance to habitat, since rodenticide use will located in prairie dog colonies, which are generally located outside most grouse habitat. And since rodenticide use will be limited, there should be little impact to grouse. Also, rodenticide application would be outside the breeding season therefore disturbance should be minimal.

Population and habitat trend would be expected to continue to increase as predicted under the 2002 LRMP

Cumulative Effects –Alternatives 1, 2, 4, and 5
Currently, the production of oil and gas, livestock grazing, dispersed recreation and hunting are the dominant human activities found within the analysis area, including federal and non-federal lands. All of these activities currently occur across the planning unit, and are expected to continue.

The increase in oil exploration and development will increase habitat fragmentation and disturbance. Also, with the increase in recreation (both managed and unmanaged); there is an increase in human disturbance to sage grouse and sharp-tailed grouse. There is also some level of habitat fragmentation from roads and trails associated with recreation.

Both species of grouse have populations that appear to be stable to increasing across the planning unit. Habitat conditions appear to be remaining consistent, and are close to meeting the seral stage and structure prescribed in the LRMP. Furthermore, implementation of these particular alternatives is compatible with the direction and scope of other decisions regarding management within the analysis area in the past.

Therefore, based on the direct, indirect, and cumulative impacts associated with these alternatives, the sage grouse and sharp-tailed grouse populations will remain viable across the planning unit.

Cumulative Effects-Alternative 3
Currently, the production of oil and gas, livestock grazing, dispersed recreation and hunting are the dominant human activities found within the analysis area, including federal and non-federal lands. All of these activities currently occur across the planning unit, and are expected to continue.

The increase in oil exploration and development will increase habitat fragmentation and disturbance. Also, with the increase in recreation (both managed and unmanaged); there is an increase in human disturbance to sage grouse and sharp-tailed grouse. There is also some level of habitat fragmentation from roads and trails associated with recreation.

The proposed action will conflict with the current LRMP direction, and future objectives to manage the area for sage grouse and sharp-tailed grouse. Both species of grouse have populations that appear to be stable to increasing across the planning unit currently, but likely would decline with this alternative. Habitat conditions would not remain consistent, and would not be meeting the seral stage and structure prescribed in the TBNG LRMP. Furthermore, implementation of this particular alternative is not compatible with the direction and scope of other decisions regarding management within the analysis area in the past.

Historically the USFS has been dedicated to conserving and managing prairie dogs on TBNG. By adopting this alternative, management direction would no longer be toward conservation, but eradication.

Therefore, based on the direct, indirect, and cumulative impacts associated with this project, the sage grouse and sharp-tailed grouse populations would not remain viable across the planning unit.

Cumulative Effects Summary for Management Indicator Species

Cumulative Effects from Alternative 1-No Action are expected to be lower than Alternative 4-Adjusted Management Area and Limited Rodenticide use which is expected to be lower than Alternative 5-Additional Category 2 areas. Alternative 5 is expected to have lower cumulative impacts than Alternative 2-Proposed action due to higher expected use of rodenticide on private lands within the analysis area. Alternative 3 would have the highest cumulative effects due to anticipated rodenticide use on both federal and private lands.

3.1.4 OTHER WILDLIFE SPECIES AND HABITAT CONSIDERATIONS

Other species of concern include the Level 1 Priority Bird Species as identified by the Wyoming Partners in Flight Wyoming Bird Conservation Plan Version 2.0 (Nicholoff 2003) and the USFWS Birds of Conservation Concern 2002, for Bird Conservation Regions #17 Badlands and Prairies (USFWS 2002, p. 40). These species and their habitats have been determined to be most in need of conservation in Wyoming. Species that may occur on the TBNG but which are outside of any effects of the proposed action (geographically or biologically) have been eliminated from further review. Table 20 below lists the species known or suspected to breed on the TBNG, based on circumstantial evidence of breeding. These species are evaluated in this report.

Table 20: Other Species Evaluated

Other Species of Concern	List
prairie falcon (*Falco mexicanus*)	USFWS 2002
Swainson's hawk (*Buteo swainsoni*)	Nicholoff 2003
golden eagle (*Aquila chrysaetos*)	USFWS 2002
upland sandpiper *(Bartramia longicauda)*	Nicholoff 2003

3.1.4.1 Existing Conditions

HABITAT AND/OR OCCURRENCES WITHIN THE PROJECT AREA

Prairie falcons require areas with cliffs or rock outcrops for nesting (Cerovski et al. 2004). There are three known prairie falcon nests on TBNG.

There are several Swainson's hawk nests located across TBNG. Swainson's hawks inhabit prairies, plains, deserts, and cultivated lands with scattered trees. Populations have declined due to loss of native grasslands and conversion of suitable agricultural land to urbanization (Cerovski et al. 2004)

Golden eagles are found throughout Wyoming in most habitats with open areas for foraging, from barren areas to open coniferous forests. Usually nests on cliff edges or large trees (Cerovski et al. 2004). There are several know nest locations on TBNG.

Upland sandpipers require open grasslands, so breeds in the eastern half of Wyoming. Prefers Great Plains grasslands, dryland grass pastures (Cerovski et al. 2004). There are sightings of upland sandpipers on TBNG.

3.1.4.2 Environmental Consequences

3.1.4.2.1 All Action Alternatives

All species analyzed could be potentially affected by using rodenticide in any prairie dog colonies outside of the MA 3.63. Although rodenticide use would be limited to special circumstances and evaluated on a case by case basis (refer to decision screens in Appendix B), any colony that is poisoned may be used as habitat by all species.

Effects of Zinc Phosphide are described in Section 3.1.1 (page 84).

The characteristics of the area may be changed through the implementation of this alternative by increasing human activities, disturbance, and increased noise levels, and loss of prairie dog habitat. But it would be on a limited basis and limited time frame, and therefore the affects are expected to be minimal. There is potential for translocation of prairie dogs on colonies identified for treatment to be moved to nearby vacant suitable habitat (unoccupied prairie dog colonies). The overall impacts from control of prairie dogs on private lands would result in a lower prey base for raptors due to lack of prairie dogs. For upland sandpipers, habitat may be improved by limited rodenticide use, as taller grasses become available.

Standards and Guidelines for nesting raptors outlined in the LRMP (USFS 2002, page 1-21) would be implemented. To protect the integrity of raptor nesting sites in the Analysis Area, development is prohibited within 0.25 mile of the active ferruginous hawk, Swainson's hawk, and golden eagle nests. To reduce the risk of nest failure, surface use will be prohibited within line-of-sight up to 0.5 mile of most active raptor nests during the breeding season (1 February through 31 July for golden eagles, and 1 March through 31 July for other species), with a

reduced buffer of 0.125 mile for red-tailed hawks. Mitigation measures for other species of raptors are detailed in the LRMP (USFS 2002).

Short Term Use-Long Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for TES, MIS and Other Wildlife Species of Concern

There is no expected loss of long term productivity under Alternative 1, 2, 4 and 5. It is likely that there will be a loss of long term productivity for prairie dogs and other sensitive species associated with prairie dog habitat under Alternative 3 as implementation of this alternative would likely impact these species and move them in a trend toward federal listing or loss of viability.

There are no expected unavoidable adverse effects under Alternative 1, 2, 4, and 5. There are unavoidable adverse effects for prairie dogs and other sensitive species associated with prairie dog habitat under Alternative 3 as implementation of this alternative would likely impact these species and move them in a trend toward federal listing or loss of viability.

There are no expected irreversible or irretrievable commitments of resources under Alternative 1, 2, 4, and 5. It is likely that there will be an irretrievable commitment of resources for prairie dogs and other sensitive species associated with prairie dog habitat under Alternative 3 as implementation of this alternative would likely impact these species and move them in a trend toward federal listing or loss of viability.

3.2 Botany

3.2.1 Threatened, Endangered, Proposed and Sensitive Plant Species

3.2.1.1 Existing Conditions

Information in this report comes from on the ground knowledge of the area, field reconnaissance, on the ground data collection, reviewing the Biological Assessment (BA) & Biological Evaluation (BE) completed for plants for the Thunder Basin Analysis Area Vegetation Management EIS, and the Thunder Basin National Grassland (LRMP) and the Northern Great Plains FEIS.

There is one threatened plant species (Ute lady's tresses, *Spiranthes diluvialis*) with potential habitat suspected to occur on the TBNG (Kelly 2007). Potential habitat was determined to occur within the project area and surveys were inconclusive as to occurrence (species does not appear above ground every year), so presence is assumed.

One endangered species, Blowout penstemon, *Penstemon haydenii* (endangered)(BP) occurs on sand dunes and blowouts below 8,000 feet. The TBNG lies on a line between the two known locations (Nebraska and central Wyoming). There is no critical habitat designated for blowout penstemon (USFWS 1987, USFWS 2009a). There is a recovery plan (Fritz et al. 1992).

There are 88 plant species listed on the 2007 Region 2 sensitive species list (Griffith 2007), of which 11 are known to occur or are suspected (biologically or geographically) to occur on the

TBNG (Roche and Proctor 2007). Of these 11 species, 3 have been dropped from further consideration due to absence of suitable habitat (*Festuca hallii*, plains rough fescue; *Triteleia grandiflora*, large flowered triteleia and *Viburnum opulus* var. *americana*, highbush cranberry).

Six of these 11 species have been dropped based upon the absence of individuals and suitable habitat in field surveys (*Botrychium lineare*, narrowleaf moonwort; *Botrychium campestre*, Iowa moonwort; *Carex alopecoidea*, foxtail sedge; *Carex leptalea*, bristle-stalk sedge; *Eleocharis elliptica*, elliptic spike rush; *Physaria didymocarpa* var. *lanata*, common twinpod).

Of these 11 species, one is known to occur in the analysis area and two additional species are considered to occur based on tentative identification (*Astragalus barrii*, Barr's milkvetch and *Eriogonum visheri*, Visher's buckwheat). No further analysis was completed for species that are not known or suspected to occur in the project area, and for which no suitable habitat is present. Two additional species were analyzed between the draft and final EIS due to changes in the Region 2 sensitive species list and direction by the USFWS.

Plant species analyzed were:

Table 21: Habitat, Biology and Threats of Analyzed TES Plant Species

Species	Status	Habitat	Species Biology	Threats
Penstemon haydenii, Blowout penstemon	Endangered	Occurs in eolian blowout dunes habitat with less than 10% basal ground cover. Blowouts are typically 130 feet (40m) in diameter or larger and may be 100 feet deep In Wyoming, P*enstemon haydenii* occurs on sandy aprons or the lower half of steep sandy slopes .	*Penstemon haydenii* blooms from mid-May to late June. *Penstemon haydenii* is well adapted to survival in blowout dunes habitat. It can recover from sand burial (Barr 1944) and develop adventitious roots from buried stem and leaf nodes (Barr 1951). The nearly horizontal rootstocks produce numerous fibrous roots, providing strong anchorage in the sands (Weedon et al., 1982). Colonization is primarily by seedlings. Bees are believed to be the primary pollinators.	Identified threats are (CPC 2008, Fritz et al. 1992, Heidel 2008)::Loss of blowout habitat by stabilization and succession of Sandhills prairie plants, Damage or death from off-road vehicle use, Repeated years of livestock grazing (cattle trampling), Infrequent favorable conditions for seed germination and establishment, Dispersal problems due to great distances between populations (habitat fragmentation), Loss of pollinators,Loss of historic disturbance elements (bison, fire, drought), Noxious weeds and control, Pyralid moth herbivory, Sand mining, and Off-road vehicle use.

Species	Status	Habitat	Species Biology	Threats
Spiranthes diluvialis, Ute lady's tresses	Threatened	Occurs in seasonally moist soils and wet meadows of drainages below 7,000 feet elevation.	It needs a pollinator and a particular fungus in the soils for symbiotic germination. It doesn't appear above the ground every year. It blooms in August and September but can't always be determined in surveys outside of blooming times.	It can be threatened by hydrologic changes, soil disturbances, plant community changes, weeds and invasives, changes to pollinators and pollinator habitat, trampling and herbivory by wildlife (ungulates and voles) and livestock.
Astragalus barrii, Barr's milkvetch	R2 Sensitive	Occurs in badland islands in grassland matrix and on eroded ridge tops, calcareous, zeolite, bentonite influenced soils, upper, midslope, more often on N and E aspects.	It needs a pollinator. It grows as a cushion plant with a tap root.	It can be threatened by soil disturbances, plant community changes, weeds and invasives, changes to pollinators and pollinator habitat, trampling and herbivory (wildlife and livestock).
Eriogonum visheri, Visher's buckwheat	R2 Sensitive	Occurs in badland islands in grassland matrix	It is an annual herbaceous species. It may need a pollinator.	It can be threatened by soil disturbances, plant community changes, weeds and invasives, changes to pollinators and pollinator habitat, trampling and herbivory (wildlife and livestock).
Cuscuta plattensis, prairie dodder	R2 Sensitive	Habitat for *Cuscuta plattensis* is sand prairie hills.	*Cuscuta plattensis* is a rootless twining parasite herb, The stems are yellowish-green, slender, and climb the full length of the stems of the host. The smooth flowers may in either loose or dense clusters and have short pedicels. The seeds are kidney shaped. *Cuscuta* spp. are not known to need a pollinator.	Threats are thought to include (Handley and Fertig 2002, Nelson 1899, Younker 1920, personal observations of habitat): Loss of host plants, Repeated, thorough soil disturbance (repeated road maintenance, cultivation), Herbicides, Lack of appropriate disturbance

3.2.1.2 Environmental Consequences

Direct and Indirect Effects

The direct effects to theses species are from herbivory (direct consumption by livestock and wildlife) and trampling. Indirect effects can occur from hydrologic changes (Ute lady's tresses), soil disturbances, plant community changes, changes to pollinators and pollinator habitat, noxious weeds, invasive species and control of these. There are no known effects to these plant species from prairie dog activities. Generally, prairie dog colonies are not suitable habitat. Although it is possible for suitable habitat to be in close proximity of prairie dog habitat it is unlikely that prairie dogs would expand into suitable habitat for these plants.

All Alternatives

There is identified potential habitat for *Penstemon haydenii* within the project area. However, the potential habitat for *Penstemon haydenii* is avoided by prairie dogs and would not be impacted by any of the alternatives.

Effects to *Cuscuta plattensis* would be similar to those existing now and to those described previously for *Penstemon haydenii*.

3.2.1.2.1 Alternative 1 - No Action

The No Action Alternative would have no effects to all the species analyzed. The conditions of riparian areas and wetlands (potential habitat for Ute lady's tresses) are expected to remain the same under the no action alternative. There are not expected to be any irreversible or irretrievable impacts (loss of occurrence) from the No Action Alternative. The character of potential habitat won't be changed by the No Action Alternative, so there are no irreversible or irretrievable impacts to potential habitat for any of the analyzed species.

3.2.1.2.2 Alternative 2-Proposed Action, Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

The Proposed Action Alternative would have no effects to all species analyzed. The conditions of riparian areas and wetlands (potential habitat for Ute lady's tresses) are expected to remain the same under the Proposed Action. There are not expected to be any irreversible or irretrievable impacts (loss of occurrence) from this alternative. The character of potential habitat won't be changed by this alternative, so there are no irreversible or irretrievable impacts to potential habitat for any of the analyzed species.

3.2.1.2.3 Alternative 3 - Boundary Management

The Boundary Management Alternative would have no effects to all species analyzed. The conditions of riparian areas and wetlands (potential habitat for Ute lady's tresses) are expected to remain the same under the Boundary Management Alternative. There are not expected to be any irreversible or irretrievable impacts (loss of occurrence) from this alternative. The character of potential habitat won't be changed by this alternative, so there are no irreversible or irretrievable impacts to potential habitat for any of the analyzed species.

Cumulative Effect Process

The ESA approach to cumulative effects has been documented in the analysis of Proposed/Endangered/Threatened (P/E/T) species. However, since this biological assessment also provides the background for the disclosure of effects for the NEPA process for this project, the Council on Environmental Quality approach has also been documented.

The Council on Environmental Quality approach to cumulative effects has been followed for sensitive species because sensitive species require findings to be made for planning area and because the species analyzed are not subject to consultation with the US Fish and Wildlife Service.

The cumulative effects have been assessed based on past actions within recorded history (200-0 years before present) and approximately 10-15 years into the future. Looking 10-15 years into the future is appropriate based upon project planning cycles (36 CFR §219.7 (4), USDA FS MBNF 2003). Because it is difficult to predict how effects to a single population might influence the status of other populations, cumulative effects were analyzed at the scale of the TBNG project analysis area.

The extreme rarity of *Penstemon haydenii* makes it vulnerable to extirpation due to random events. The habitat potential for *Penstemon haydenii* is not well understood outside of its existing occurrences, therefore, habitat trend in the project area cannot be established.

Since there is very little known about interactions among disjunct populations of *Penstemon haydenii*, it is difficult to predict how effects to a single population might influence the status of other populations. Therefore, cumulative effects will be analyzed at the scale of the TBNG for *Penstemon haydenii*.

The extreme rarity of *Cuscuta plattensis* makes it vulnerable to extirpation due to random events. The habitat potential for *Cuscuta plattensis* is not well understood, therefore, habitat trend in the project area cannot be established.

Since there is very little known about interactions among disjunct populations of *Cuscuta plattensis*, it is difficult to predict how effects to a single population might influence the status of other populations. Therefore, cumulative effects will be analyzed at the scale of the TBNG for *Cuscuta plattensis.*

Cumulative Effects by Alternative, Threatened or Endangered, and Sensitive Species

Alternative 1- No Action

Since there is a "No Effect" determination for Ute lady's tresses there are no cumulative effects.Since there are not any direct or indirect effects of the any of the alternatives there are not any cumulative effects to Blowout penstemon (effects of the action when added to past, on-going or reasonably foreseeable actions) (36 CFR § 220.4 (f) of 07/24/08).

Cumulative effects from past present and future actions could exist for Barr's milk-vetch and Visher's buckwheat. All of the actions listed in the Cumulative Effects Chart could have an effect on these sensitive species. Even though the present and future actions have the least

amount of impact, cumulatively with the past actions there is an effect which could be adverse. However, it has been observed that Barr's milk-vetch appears to fill in areas where ground disturbance has occurred in the past, such as old roads that had crossed through suitable habitat. Even though present and future effects can be mitigated to some degree, past action effects would have already occurred. The No Action Alternative would not add adverse effects to the existing past, present, or foreseeable future actions.

Since there are not any direct or indirect effects to Prairie dodder from any of the alternatives when design criteria are included, there are not any cumulative effects (effects of the action when added to past, on-going or reasonably foreseeable actions) (36 CFR § 220.4 (f) of 07/24/08).

Alternative 2-Proposed Action, Alternative 3-Boundary Management, Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

Cumulative Effects for Alternative 2, 3, 4, 5 would be identical to Alternative 1.

None of the effects were determined to be significant. The Forest Service maintains discretion to take actions to protect T/E/S species.

The Biological Evaluation Review was prepared based on presently available information on life history stages, population structure, longevity, mortality, and seed biology and habitat for these species and information available on the effects of the proposed action and past, ongoing and reasonably foreseeable actions. Additional information beyond that presented in the Biological Assessment and Biological Evaluation for these plant species including life history stages, population structure, longevity, mortality, and seed biology, is not available. There is no reasonable method to obtain this information but it is not needed to make an informed decision on this project or to evaluate reasonably foreseeable significant adverse impacts on the human environment.

Summary of Environmental Consequences
The following table presents a summary of the environmental consequences for each T/E/S plant species evaluated for each alternative.

Table 22: Summary of Environmental Consequences for Each Species by Alternative

Common Name	Scientific Name	Status	Environmental Consequences		
			Alternative 1 No Action,	**Alternative 2, Proposed Action, 4, 5**	**Alternative 3 Boundary Management**
Ute lady's tresses	*Spiranthes diluvialis*	Threatened	No Impact	No Impact	No Impact
Blowout Penstemon	*Penstemon haydenii*	Endangered	No Impact	No Impact	No Impact
Barr's milkvetch	*Astragalus barrii*	Sensitive	No Impact	No Impact	No Impact
Visher's buckwheat	*Eriogonum visheri*	Sensitive	No Impact	No Impact	No Impact
Prairie dodder	*Cuscuta plattensis,*	Sensitive	No Impact	No Impact	No Impact

Biological Determinations for Threatened, Endangered and Sensitive plant species
For threatened, endangered species, a biological determination must address whether actions are, or are not, likely to adversely affect the listed species.

The determination for Ute lady's tresses is that management actions will have **no effect** on *Spiranthes diluvialis* under all alternatives. No effects are expected because:

- There is potential habitat but none of it is known to be occupied. However not all surveys were consistent with survey protocol (USFWS 1995) for *Spiranthes diluvialis*. There still remains the very small possibility that potential habitat could be found to be occupied, however none of the alternative will effect potential habitat.
- Because there have been numerous surveys in the vicinity of the project area for *Spiranthes diluvialis* from 1997-present (NARM 1997, Hazlett 1997, 1998, by Forest Service employees in 2004 McClung 2005, Heidel 2006, 2007 and by BKS in 2005 and 2006 BKS 2006 a,b,c) and none of the surveys has found any individuals of *Spiranthes diluvialis* on the NFS lands of the TBNG , there is a very small possibility that any of the potential habitat will ever be found to be occupied.
- Because the potential habitat for Ute lady's tresses in the TBNG was not predicted in the potential distribution by Fertig and Thurston (2003).
- Because the FS maintains discretion to modify actions if any *Spiranthes diluvialis* were found to occur on TBNG.
- Prairie dog habitat is 10-11 miles away from known occurrences, there will be no effect to the known occurrences or to pollinators for the known occurrences from any of the actions included in the alternatives.
- There is no designated critical habitat for *Spiranthes diluvialis*, so there can be no effects to critical habitat from any of the actions included in the alternatives.

The risk of affecting individuals is extremely low in all action alternatives because there are not any currently reported or known populations of *Spiranthes diluvialis* on TBNG nor would any of the actions associated with the alternatives affect individuals.

For sensitive species, a biological determination must assess whether the actions are, or are not, likely to cause a trend toward federal listing or a loss of viability.

Based on the preceding information on population viability, proposed management actions and cumulative activities (past, present, and future actions) a determination of **"may adversely impact individuals"** however **"they are not likely to result in a loss of viability within the planning area, nor cause a trend towards Federal Listing or a loss of Species Viability"** for Barr's milkvetch and Visher's buckwheat.

The risk of affecting individuals is low in all action alternatives because the habitat the plant occupies will not be affected by any of the alternatives. The expressed uncertainties exist for Barr's milkvetch and Visher's buckwheat because research and literature is very limited for these species.

Table 23: Summary of Biological Determinations for Threatened, Endangered and Sensitive Plant Species

Common Name	Scientific Name	Status	Biological Determination		
			Alternative 1	Alternatives 2, 4, 5	Alternative 3
Ute lady's tresses	*Spiranthes diluvialis*	Threatened	No Effect	No Effect	No Effect
Blowout Penstemon	*Penstemon haydenii*	Endangered	No Effect	No Effect	No Effect
Barr's milkvetch	*Astragalus barrii*	Sensitive	MAII	MAII	MAII
Visher's buckwheat	*Eriogonum visheri*	Sensitive	MAII	MAII	MAII
Prairie dodder	*Cuscuta plattensis,*	Sensitive	No Effect	No Effect	No Effect

MAII= may adversely impact individuals but not likely to cause a trend to federal listing or a loss of viability. This call is based on cumulative effects from Past, Present, and Future actions not any of the alternatives.

3.2.2 Plant Species of Local Concern

3.2.2.1 Existing Conditions

Potential Affected plant species of local concern
There are seven plant species considered plant species of local concern that are known or suspected to occur on the TBNG (Roche and Proctor 2007). Of these seven species, one species, *Astragalus hyalinus,* summer milkvetch, is known to occur in the analysis are:

Of these seven species, six have been dropped from further consideration due to absence of individuals or absence of suitable habitat based on field review (*Chenopodium subglabrum*, smooth goosefoot; *Euthamia graminifolia*, Flat-top (fragrant) goldentop (goldenrod); *Lilium philadelphicum*, Wood (wild) lily; *Palafoxia rosea* var. *macrolepis*, Rosy palafox; *Pectis angustifolia*, Lemonscent (Crown-seed fetid-marigold, *Penstemon laricifolius* var. *exilifolius*, Larchleaf beardtongue).

The one plant species analyzed in the plant species of local concern report was:
Astragalus hyalinus, summer milkvetch.

Table 24: Species of local concern analyzed

Species	Status	Habitat	Species Biology	Threats
Astragalus hyalinus, summer milkvetch	Local Concern	Occurs in badland islands in grassland matrix and on eroded ridge tops	It needs pollinator. It grows as a cushion plant with a tap root.	It can be threatened by soil disturbances, plant community changes, weeds and invasives, changes to pollinators and pollinator habitat, trampling and herbivory (from livestock and wildlife).

3.2.2.2 Environmental Consequences

3.2.2.2.1 All Alternatives

Direct and Indirect Effects
The direct effects to summer milkvetch, is from herbivory (direct consumption) and trampling (livestock or wildlife). Indirect effects can occur from soil disturbances, plant community changes, changes to pollinators and pollinator habitat, noxious weeds, invasive species and control of these.

Cumulative Effects
The Council on Environmental Quality approach to cumulative effects has been followed below because plant species of local concern require findings to be made for planning area and because the species analyzed are not subject to consultation with the US Fish and Wildlife Service. The cumulative effects have been assessed based on past actions within recorded history (200-0 years before present) and approximately 10-15 years into the future. Looking 10-15 years into the future is appropriate based upon project planning cycles (36 CFR §219.7 (4), USDA FS MBNF 2003) and the term of the permit. Because it is difficult to predict how effects to a single population might influence the status of other populations, cumulative effects were analyzed at the scale of the Thunder Basin Vegetation Management project analysis area. Cumulative effects from past, present, and future actions; and wildfire will continue to influence the occurrences of summer milkvetch, its habitat and its pollinators.

Cumulative Effects by Alternative for Species of Local Concern

Alternative 1-No Action
Cumulative effects from past present and future actions could exist for summer milkvetch, *Astragalus hyalinus*. All of the actions listed in the Cumulative Effects Chart could have an effect on this species. Even though the present and future actions have the least amount of impact, cumulatively with the past actions there is an effect which could be adverse. However, it has been observed that summer milk-vetch appears to fill in areas where ground disturbance has occurred in the past, such as old roads that had crossed through suitable habitat the same as Barr's milk-vetch. Even though present and future effects can be mitigated to some degree, past action effects would have already occurred. The No Action Alternative would not add adverse effects to the existing past, present, or foreseeable future actions.

Alternative 2-Proposed Action, Alternative 3-Boundary Management, Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

Cumulative Effects for Alternative 2, 3, 4, and 5 would be identical to Alternative 1.

The Biological Evaluation Review was prepared based on presently available information on life history stages, population structure, longevity, mortality, and seed biology and habitat for this

species and information available on the effects of the proposed action and past, ongoing and reasonably foreseeable actions. Additional information beyond that presented in the Biological Assessment and Biological Evaluation for these plant species including life history stages, population structure, longevity, mortality, and seed biology, is not available. There is no reasonable method to obtain this information but it is not needed to make an informed decision on this project or to evaluate reasonably foreseeable significant adverse impacts on the human environment.

None of the effects were determined to be significant. The Forest Service maintains discretion to take actions to maintain the viability of local concern plant species.

The Plant Species of Local Concern Report was prepared based on presently available information on life history stages, population structure, longevity, mortality, and seed biology and habitat for this species and information available on the effects of the management actions proposed and past, ongoing and reasonably foreseeable actions. Additional information beyond that presented in the Plant Species of Local Concern Report for this species including life history stages, population structure, longevity, mortality, and seed biology, is not available. There is no reasonable method to obtain this information but it is not needed to make an informed decision on this project or to evaluate reasonably foreseeable significant adverse impacts on the human environment.

Table 25: Summary of viability analysis for species of local concern

Common Name	Scientific Name	Status	Viability Analysis		
			Alternative 1	Alternative 2, 4, 5	Alternative 3
Summer milkvetch	*Astragalus hyalinus*	Local concern	May affect individuals NLV	May affect individuals NLV	May affect individuals NLV

- May Affect based on cumulative effects from past, present, and future actions; not the existing plan or plan amendments.
- NLV = no loss of viability.

Short Term Use-Long Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Botany TES and Other Species of Concern

There is no expected loss in long term productivity from any of the alternatives.

There are no expected unavoidable adverse effects from any of the alternatives.

There are not expected to be any irreversible or irretrievable impacts (loss of occurrence) from any of the alternatives. The character of potential habitat won't be changed by the alternatives, so there are no irreversible or irretrievable impacts to potential habitat for any of the analyzed species.

3.3 Vegetation

3.3.1 Existing Conditions

Following is a summary of existing vegetation conditions. Specific information about these conditions can be found in the Vegetation Specialist report.

Vegetation Types

From the analysis and observations, the twenty two vegetation community types are all used by livestock. The main communities described earlier in the document occupy the majority of the acreage across the analysis area, and therefore, support the majority of the livestock use within pastures.

Wyoming big sagebrush/blue grama-western wheatgrass and Wyoming big sagebrush/western wheatgrass shrub steppes have been affected by past and current drought conditions, significantly more in some areas, and livestock grazing based on the data analysis. This community comprises the most acreage within the analysis area, and is the most common plant community in which livestock use is based. From the analysis, a stable to a slight decline in plant health is evident in many communities within the analysis area.

Blue grama-threadleaf sedge sodgrass steppe communities have also been affected by the drought conditions. In some areas, where prairie dog expansion has slowed due to the plague event, plant community health has been stable. Drought combined with grazing and/or prairie dog activity, have resulted in mortality of blue grama in some communities within the black footed – ferret re-introduction area. Overall, a decline in plant vigor was observed within some areas of the analysis area due to drought conditions.

Ponderosa pine/bluebunch wheatgrass plant communities have remained stable in terms of plant health and vigor during the course of the drought. Usually, sites are found on shallower ecological sites. Many of these communities are at risk of catastrophic wildfire, as determined by Perryman and Laycock (2000). This concern about catastrophic wildfire has also been expressed by local ranchers and Forest Service personnel.

Needleandthread/blue grama sodgrass steppe communities have had a decline in plant vigor and production over most of the analysis area due to the drought conditions combined with livestock grazing. Drought and/or drought combined with livestock and wildlife use appears to have increased plains prickly pear cactus in some areas. Cheatgrass is also an increasing threat in many pastures within the analysis area, especially on loamy sites. Composition data from the analysis indicated that pastures with a moderate to high grazing intensity had higher frequency and cover of blue grama and a lower composition of needleandthread as compared to pastures with lighter grazing intensities.

Greasewood/western wheatgrass plant communities over most of the analysis area are in poor condition due to the amount of annual invasives that now comprise the majority of the understory vegetation. Cheatgrass and other winter annual mustards comprise an average of approximately 20% of the canopy cover on these sites in the analysis area. Historically, these communities have received high use due to their proximity to water and shade next to ephemeral streams. Drought has had some effect on this plant community, mainly on the understory herbaceous vegetation. Use typically is moderate to high in the plant community. Greasewood may be expanding in density and frequency in some saline upland ecological sites within the analysis area.

Plains cottonwood/willow/sedge-rush plant associations have historically had heavy to high moderate livestock use, primarily due to the proximity to live water sources and shaded areas. With the completion of the Fiddleback Land Exchange in 1999, a large portion of the Cheyenne River and Antelope Creek was acquired by the Forest Service. Specific seasons of use and more intensive livestock management for these plant communities guide the use of these pastures. Monitoring has indicated a decline in plant health, especially in cottonwoods, of which much can be attributed to drought conditions, possible decline in subsurface moisture. In some cases, depending on timing and proximity to water sources, livestock are impacting cottonwood sapling growth, as are big game populations, especially elk and deer.

Drought Impacts

Drought conditions are common on the Northern Great Plains 20 to 25% of the time (Holecheck et al. 1999). Based on analysis of precipitation data, drought conditions are likely to occur in the analysis area approximately 25% of the time, or 1 out of every 4 years on average. The severity of drought conditions also has a wide variance within the analysis area. Precipitation levels constantly fluctuate in the analysis area, but one answer is clear: well below average growing season precipitation has occurred over the past seven years in the Cellers/Rosecrans; Broken Hills; and Hilight Bill Geographic Areas and is the largest contributor to decreased vegetation production. If conditions continue, this year could be the eighth consecutive year of drought. Drought conditions present the biggest impact to vegetation production, structure, and, when combined with livestock and wildlife grazing, plant species composition and density. Proactive management and flexibility to adjust for drought conditions varies considerably on some ranch units in the analysis area. Drought conditions have not been as severe in the Fairview/Clareton; Upton/Osage; and Spring Creek Geographic Areas.

Prairie Dog Impacts

Prairie dog colonization and historic colonies have impacted vegetation communities within the analysis area with suppressed canopy cover of tall perennial grasses, protective mulch cover, and species composition. From data analysis, prairie dog colonies, active or inactive, also contain a higher percentage of forbs as well as invasive annual species. Resource concerns have been noted in some pastures with large prairie dog colonies present. Future livestock management decisions will need to take into account vegetation condition of active/inactive prairie dog colonies when determining livestock use. Considerations for general plant health need to be given to all pastures regardless of the amount of prairie dog colonization taking place.

Invasive Species

Control efforts are keeping most noxious weed species in check (consult Invasive Species Strategy section for more information). However, frequency and density of non-native invasive species, especially cheatgrass and Japanese brome, are increasing in some areas of the analysis area. Invasive non-native annual species make up a significant portion of some ecological sites. These species generally are also invading some of the most productive ecological sites within the analysis area. Spread of annual grasses is not directly linked to overgrazing in all cases, as it has also been observed in areas that receive light to moderate grazing as well as areas with no grazing (range study exclosures and the Thunder Basin Work Center administration site). Drought has most likely helped expand annual invasives to the greatest extent within the analysis area, based on analysis and photo points.

The following table illustrates invasive annual densities by ecological site within the TBNG.

Invasive Annual Species by Ecological Site

Ecological Site	Average Canopy Cover
Saline Upland	19.2%
Sandy	12.6%
Clayey	8.0%
Loamy	16.0%
Shallow Loamy	12.0%
Shallow Clayey	6.0%
Shallow Sandy	1.4%
Very Shallow	< 1.0%

Most pastures within the grasslands have some level of invasive annual infestation present. The majority of pastures have approximately 5% canopy cover of invasive annuals in part of the pasture. An estimate of the area that is significantly affected by invasive annuals is approximately 10% across the grassland with an approximate average canopy cover of 9.5%

Vegetation Seral Stages and Structure
Since the majority of the analysis area is located in a sagebrush/grassland vegetation type, Wyoming big sagebrush was determined to be a climax vegetation community in many areas. The presence/absence of sagebrush was one key factor when determining seral stages within the analysis area.

Objectives, as defined in the LRMP, are "concise, time-specific statements of measurable planned steps taken to accomplish a goal and are generally achieved by implementing a project or activity. After analyzing acreage percentages of seral stages and structure within Geographic Areas, it was evident that many areas were meeting and some areas were not meeting LRMP objectives and/or desired conditions. (USFS, 2008a)

Drought conditions severely impacted some sites that were capable of producing these desired conditions within the analysis area during the time of data collection. Another factor influencing the existing mix of seral stages is that previous management strived for sustainable agriculture practices, which usually had the highest forage production (LRMP 1985). Therefore, the majority of the acreage was managed for the mid-seral range. Past moderate grazing intensity across most of the analysis area could explain why the majority of the analysis area acreage falls within Late Intermediate to Early Intermediate seral stages and especially moderate structure classes, regardless of Geographic Area.

Data indicate a shortage in late seral status acres in the Broken Hills and Cellers Rosecrans Geographic Areas. Some of this shortage is associated with the current precipitation shortage and past grazing practices. These shortages would be resolved through improved vegetation management practices and a return to average precipitation levels. With the exception of Fairview/Clareton and Upton/Osage Geographic Areas all of the other seral stage objectives are currently being met. Fairview/Clareton has too many acres in the late and early seral stages, with

not enough in the intermediate stages. Upton/Osage has the vast majority of acres in the late intermediate stage and needs to increase acres in the other three stages.

Data indicate a shortage in structure objectives within the high and low ranges in Broken Hills, and Cellers Rosecrans Geographic Areas. This is due in part to past LRMP objectives (1985), past grazing practices and current drought conditions. It is believed that with the return to normal precipitation that vegetation health improvement will move some of the moderate structure into high structure. This will not help the shortage in low structure. An increase in acres of low structure would come from a higher grazing intensity or an increase in prairie dogs. Spring Creek Geographic Area is meeting LRMP objectives. Fairview Clareton and Upton Osage Geographic Areas have too many acres in late seral condition. The agricultural drought has not been as severe in these areas as it has in Broken Hills, Cellers Rosecrans, and Hilight Bill Geographic Areas.

Overall, the known existing mix of seral stages is not significantly different from desired seral conditions outlined in the LRMP. LRMP information was gathered during a period of favorable precipitation in the 1990's. Prolonged drought conditions combined with high moderate to heavy grazing intensity by livestock and wildlife has reduced vegetation health and vigor in some areas. Annual invasive species present the biggest threat to the desired mix of seral stages due to the ecological thresholds the species present once established.

More importantly, managing vegetation for an upward trend in vegetation health throughout the analysis area should provide the desired seral stage mix across the landscape. Lighter grazing intensities may be necessary in some pastures to move existing plant communities into an upward trend needed for late seral conditions. In most cases, management considerations (rest/deferment, proper use levels) for native cool season perennial plants can move pastures within the analysis area into an upward trend. In some cases, heavier grazing intensities may be necessary to achieve early seral conditions.

When analyzing existing seral conditions vs. desired objectives, acres of late seral conditions are low in these Geographic Areas. To achieve desired objectives, return of average precipitation combined with management changes should lead to an upward trend. It is predicted that as prairie dog numbers bounce back from the recent plague epidemics that early seral stage acres will be met or be exceeded.

Table 26: Existing Conditions vs. Desired Vegetation Seral Stage Objectives by GAs which contain the Black-footed Ferret Re-introduction Habitat MA 3.63.

G.A		Late acres	Late Int. acres	Early Int. acres	Early acres
Cellers Rosecrans	Existing	3,948 (5%)	35,923 (39%)	27,605 (30%)	24,075 (26%)
	Desired	10-20%	20-30%	25-35%	25-35%
Broken Hills	Existing	17,337 (11%)	66,654 (43%)	47,734 (30%)	25,789 (16%)
	Desired	15-25%	30-40%	25-35%	10-20%

The following table summarizes seral status broken out at the management area level (black footed-ferret re-introduction area).

Table 27: Existing vs. Desired Vegetation Seral Stage (MA 3.63)

Management Area		Late acres	Late Int. acres	Early Int. acres	Early acres
3.63	Existing	8% 3,722 ac.	14% 6,897 ac.	34% 16,332 ac.	44% 20,969 ac
	Target/Range	15% (10-15%)	10% (10-15%)	15% (15-20%)	60% (60-65%)

In most cases in MA 3.63, where early seral conditions are lower than desired, the absence of active prairie dog colonies and their associated disturbance to vegetation is the main factor. This is due to prairie dog populations being severely impacted by plague. As prairie dog colonies repopulate within the analysis area, early seral conditions should most likely be achieved or exceeded in most management areas.

Table 28: Management Area Existing Vegetation Structure vs. Desired Vegetation Structure Objective Range within the Black-footed Ferret Reintroduction habitat (LRMP, 2001).

Management Area		High	Moderate	Low
3.63	Existing	10% 4,496 ac.	50% 24,104 ac.	40% 19,321 ac
	Target/Range	30% (30-35%)	10% (10-15%)	60% (60-65%)

Table 28 summarizes existing vegetation structure contributed from MA 3.63 lying within the analysis area compared to guideline structure goals outlined in the 2001 LRMP.

Riparian Resources

Stream dynamics have changed considerably over the past 20 to 40 years in many of the larger stream systems in the analysis area. Some obvious changes include less available surface water, the absence of episodic flood events, and herbaceous species stabilizing silt and sand depositions.

Changes on these streams have affected the early seral habitat conditions needed for plains cottonwood regeneration in some areas. Drought conditions have impacted the growth of cottonwood saplings over most of the data collection period. Browsing of cottonwood saplings is the main concern in riparian areas capable of supporting cottonwood plant associations. Beaver activity has affected mid-seral cottonwood galleries, and many late seral galleries are slowly thinning due to mortality caused by drought and natural causes. Enhancing existing early seral habitat is critical in maintaining viable cottonwood communities in the analysis area.

Restricted seasons of use have had some beneficial effects in some riparian areas within the analysis area in terms of leaving sufficient stubble and protective herbaceous cover. In many cases, these plant communities are mainly comprised of warm season plant species. Pasture size, lack of upland water sources, maturation of the various plant communities, invasive species, animal numbers and drought conditions have all presented challenges for the management of riparian areas within the analysis area.

Generally, management of ephemeral stream systems will depend on stream capabilities and existing plant communities in relation to desired resource conditions. Areas that exhibit the capability of producing sustainable woody regeneration of adequate size and scale will be

managed to move toward those objectives. Climatic conditions usually determine riparian area characteristics over most of the analysis area.

3.3.2 Environmental Consequences

3.3.2.1 Alternative 1 – No Action

Vegetation Seral Status/Structure Classification: Direct and Indirect Effects

This alternative would have no affect on vegetation resources over a short term interval however, it could have a beneficial affect over the long term interval. The number of acres affected by prairie dogs from the near past has been regulated by plague. The highest numbers recorded were in 2000. The plague event reduced numbers (acres affected) from 2001 to 2006. Therefore, structure classification has been adversely affected by reducing the number of acres of low structure. In fact MA 3.63 has a shortage of early seral stage acres and a shortage of acres classified as low structure within Cellers Rosecrans and Broken Hills Geographic Areas . Since seral stages are determined by plant composition as well as density, the reduction in prairie dog numbers probably did not affect seral status in the short term however, the absence of prairie dogs in the long term would allow some of the areas to trend upward toward another seral stage and away from LRMP objectives. Under this scenario, if plague subsides for some time, it may be possible to correct the disparity in early seral status and low structure. This is due to the ability of prairie dogs to actively create or modify its habitat by removing vegetation in and around its colonies.

In the long term, as prairie dog population increases, colonies will expand into areas of vegetation in late to late intermediate seral status. With increased prairie dog activities in these later seral communities, plant community composition would change over time to favor lower stature plants which are characteristic of earlier seral stages. A disclimax in seral stages would continue with prairie dog occupation until plant communities stabilize with a species composition that could withstand clipping and burrowing activities. Once this plant community is present, plant health should be stable to improving depending on prairie dog densities, climatic conditions, and improved or continuing proper livestock management.

Availability of Forage for Livestock and Wildlife: Direct and Indirect Effects

The availability of forage for livestock and wildlife would not be affected assuming that permitted livestock are stocked properly. There is a perception of direct competition for forage resources between livestock and prairie dogs. It has been determined that cattle and prairie dogs diets were most similar during the spring. Sharps and Uresk found that where livestock and prairie dogs keep vegetation suppressed, there was a higher nutrition level that attracted greater herbivore use. Even though studies found that vegetation on prairie dog colonies was shorter, it did not discourage livestock grazing. In fact, most research indicates that forage quality is higher on prairie dog colonies. However, Guenther cautioned, that compensation of forage quality for forage quantity may be related to the age of the prairie dog colony combined with the amount and timing of precipitation. Within the colonies, prairie dogs will utilize a certain amount of forage that would not be available to livestock. A long term effect would be a balance of use (livestock and wildlife) on vegetation which will need to be managed so as to maintain vegetation health regardless of seral stage.

Prairie dog colonies, through their activities, maintain or increase niches where non-native invasive species, such as cheatgrass and Japanese brome, can increase in densities and frequency. Although these annuals would be utilized by prairie dogs and livestock they would provide forage for a short time and would continue to persist (see Vegetation Report). Certain seral stages, such as early intermediate rangelands could be reduced to an early seral stage or cross ecological thresholds into a stable non-native invasives state due to the competition from annuals reducing native perennial vegetation.

This could be an adverse or beneficial long term effect depending on the particular area. An adverse and/or beneficial affect would depend on if an area had sufficient or insufficient early seral acres and low structure. However, an increase in annual non-native invasive species is considered an adverse effect long and short term.

3.3.2.2 Alternative 2-Proposed Action, 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

Vegetation Seral Status/Structure Classification: Direct and Indirect Effects
The seral status and structure classification for this alternative would be the same as for Alternative 1 except for:

- Reducing unwanted expansion onto private property – if this was to occur in an area that had a shortage of early seral status acres, this would become an adverse long term effect unless livestock numbers were increased to achieve or maintain early seral acres.
- Reducing livestock grazing to create visual and physical barriers. This would be a beneficial short and long term effect if sufficient early seral status and low structure acres have been achieved to meet the LRMP objectives. If not, this would be an adverse short and long term effect.

Availability of Forage for Livestock and Wildlife: Direct and Indirect Effects
The availability of forage for livestock and wildlife for this alternative would be the same as Alternative 1 except for:

- Reducing livestock grazing could have a short and long term adverse effect to ranch operations.
- Livestock grazing would be managed to provide buffer areas to maintain high structure – This could be an adverse short and long term effect to livestock operators by reducing AUMs. From personal observations of prairie dog colonies, it is believed that prairie dogs will modify the habitat around them. In fact, prairie dogs were observed clipping 18 to 20 inch tall Wyoming big sagebrush to expand their colony. Hedging resulting in death of Wyoming big sagebrush was evident by the plant skeletons in areas around this colony. This could be detrimental to sagebrush obligate species such as sage grouse.

3.3.2.3 Alternative 3 – Boundary Management

Vegetation Seral Status/Structure Classification: Direct and Indirect Effects
The seral status and structural classification for this alternative would be the same as Alternative 1 except for:

- Prairie dog colonies within ½ mile of private lands/National Grassland boundaries would be controlled – This could be an adverse long term effect due to the loss of acres in early seral status and low structure. The short term effect would be beneficial since vegetation condition would immediately begin to improve after controlling prairie dogs and would remain beneficial until another seral stage was achieved. If early seral stage acres were recruited in another portion of the Geographic Area then there would be no adverse effects long or short term. However, this alternative would most likely not meet the LRMP objectives for vegetation under seral status and structure.
- Livestock grazing would be managed to provide buffer areas to maintain high structure – This could result in a change in the distribution and configuration of high structure within the area.

Availability of Forage for Livestock and Wildlife: Direct and Indirect Effects
The availability of forage for livestock and wildlife for this alternative would be the same as Alternative 1 except for:

A direct effect of this alternative for the long term would be additional forage being available for livestock use. However, in the short term, until vegetation reached high structure there would be less forage available. If vegetation in the half mile strip is in early seral status the species composition is generally not conducive to developing high structure. By not allowing grazing in the ½ mile buffer, available forage will also be reduced until high structure is achieved. Under this scenario, to achieve high structure, the composition of the vegetation would have to trend toward a later seral status. This is expected to take 10 years or more to move early seral to late intermediate seral status. Therefore, under this scenario available forage for livestock may be reduced until high structure is achieved.

Structure can be greatly influenced by precipitation levels, timing, and plant vigor. Precipitation levels and timing affects plant growth whether livestock are present are not. Without sufficient precipitation plants will not produce their normal vegetation growth or possibly, depending on precipitation timing and quantity, stay dormant. Vegetation vigor also plays an important role in individual plant response to precipitation. As plant health improves, litter levels build up and root systems develop to their fullest extent. Therefore when moisture is received, individual plants can respond quickly and with improved litter cover, moisture will be retained for a longer period of time due to the micro-climate developed by the litter level. With "normal" precipitation levels, timing, and improved vegetation vigor and high structure may be achieved in a shorter time frame.

Short Term Use-Long Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources

Under Alternative 1 there could be loss of long-term productivity in vegetation communities due to conversion from later seral stages to earlier stages as prairie dog colonies expand. There is no expected loss in long-term productivity under Alternatives 2, 3, 4 and 5.

There are no expected unavoidable adverse effects to vegetation under any of these Alternatives.

There are no expected irretrievable or irreversible impacts for any of these Alternatives.

Cumulative Effects

Cumulative effects are discussed for the analysis area and the adjacent areas of influence. The cumulative effects analysis area is bound spatially to the TBNG and Campbell, Niobrara, Weston, and Converse counties. They are bound temporally by the beginning of the earliest recorded activities, present activities, and foreseeable future for which there are firm plans to indicate that future activities are likely to occur. In general this runs from the early days of livestock grazing and farming (homestead era, approximately 1862) on lands that are now within the project area and runs approximately two decades beyond this assessment date. Cumulative effects were determined based on a list of past, present, and reasonably foreseeable actions in the analysis area developed by the IDT. Cumulative effects assessments are conducted for each alternative considered in detail. This includes Alternative 1 - No Action, Alternative 2 – Proposed Action (Plan Amendment), Alternative 3 – Boundary Management, Alternative 4- Adjusted Management Area and Limited Rodenticide Use and Alternative 5-Additional Category 2 Areas.

Cumulative Effects Alternative 1 – No Action

Rangeland and Forested Vegetation:

Cumulative effects from past improperly managed livestock grazing practices, wildfires, railroad activity, oil well activity, natural gas/oil pipe-lines, recreation activities, increases in certain wildlife species populations (especially big game species and rabbits/hares), coal mining, and road construction have resulted in undesirable changes in vegetation communities. Currently improved management of livestock grazing, regulation of off road vehicle traffic, improved energy exploration/extraction techniques and rehabilitation practices, improved wildlife management, and improved road/railroad management have reduced some of the adverse affects; therefore cumulative effects in some cases are currently trending upward (beneficial effect). Coal mines, new roads/railroads, and new oil/gas wells and their pipelines/power-lines will always have an adverse environmental effect of some kind. These activities are removing vegetation in the disturbance areas for the foreseeable future if not longer, even though these areas will be rehabilitated. Some activities such as off road vehicle traffic management, road management, wildlife management, prescribed burning, and grazing management can achieve a beneficial effect. However, all of these activities and Alternative 1 (no action) will not cumulatively add adverse environmental effects. Alternative 1, assuming a reduction in plague epizootics, will help achieve the LRMP vegetation objectives, especially in the short term.

Non-native Invasive Species

Past cumulative actions that have an impact on the risk of non-native species invasion or expansion include unmanaged grazing and browsing, wildfires, railroad activity, oil and gas well

activities, recreation activities, coal mining, and roads. Any activity that results in sites with a lack of native vegetation, increased bare soil, or an opening in a shade producing canopy is likely to create niches where there is a potential for non-native invasive species invasion. Currently with improved management practices which include rehabilitation of disturbed areas by reseeding with an approved native seed mix, utilizing livestock to graze on invasive species during their growth cycle, and treatment of non-native invasive species with herbicides have halted the expansion of these species and in some cases, project sites, have reduced density of these species. All ground disturbing activities open up a niche for these species to expand. Therefore it is imperative to include in all future ground disturbing projects stipulations to contain or control non-native invasive species.

Prairie dogs, through their normal activities, will produce a certain amount of bare ground. Bare ground is an open niche for the establishment of non-native invasive species. However, the prairie dog is well known for clipping herbaceous species for food and/or for maintaining sight distance around their burrows. From field reviews, it appears that non-native invasive species, mostly cheatgrass and Japanese brome, expand into prairie dog colonies; however, prairie dogs utilize these species as food thereby suppressing these non-native invasive herbaceous species to some degree.

Prairie dog colonies are generally wildfire resistant. This is due to a lack of continuous and/or density of fine fuels. An increase in fire frequency is a major contributor of non-native invasive species, mostly cheatgrass, expansion. Due to the lack of fine fuels within the colonies, it appears that these areas are somewhat fire resistant. The only time non-native species would be expected to increase in density would be if the plague reduced prairie dog densities within the colonies.

Cumulatively this alternative, Alternative 1, will not add any adverse effects to vegetation in addition to the past, present, and/or foreseeable future activities

Cumulative Effects Alternative 2-Proposed Action, Alternative 3 – Boundary Management, 4- Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

The cumulative effects for these alternatives would be the same as Alternative 1.

3.4 Soil Resources

3.4.1 Existing Conditions

Black-tailed prairie dog colonies are found on a variety of soils (Clippinger 1989, Reading and Matchett 1997, Reid 1954), but prairie dogs prefer deep and moderately well to well-drained soils on gentle slopes. Preferred soils are deep silty, clayey or loamy, but colonies will expand into less desirable soils that are shallow and/or rocky. They avoid soils that are frequently flooded or excessively sandy and unable to support burrow systems. Prairie dogs also select soils that have been previously disturbed (Knowles 1986, Licht and Sanchez 1993). This includes disturbances commonly associated with past homestead activity, abandoned fields and livestock concentrations (water sources and developments, mineral sites, supplemental feeding sites, oilers, corrals). Historically, prairie dogs were most likely attracted to areas heavily

impacted by bison and other large native herbivores (USFS, 2005). In areas with large prairie dog colonies, erosion rates seem to be higher than the surrounding landscape. Nielsen (2005) found that 3.5 times more sediment is delivered annually through water erosion from prairie dog towns and that prairie dog towns have about 176 times more erosional soil loss due to wind erosion when compared to areas without prairie dog towns. This results in a total of 9.5 times more erosional soil loss from prairie dog towns. (Nielsen, 2005).

Erosion

Erosion is the detachment and removal of soil material. Soil structure, texture class, and moisture content determine susceptibility to erosion. In addition, soil is considered a nonrenewable resource because of the length of time required for its formation. Due to this limitation, most episodes of soil loss are functionally permanent (irreversible).

Potential erosion hazard ratings were assigned to all soil map units in the applicable soil surveys. Erosion hazard is the inherent susceptibility of a soil to erosive forces such as raindrop impact, overland flow, and wind. These ratings are based on the risk of soil loss after disturbances that result in 50 to 75 percent exposed, roughened mineral surface layer. Wind and water erosion hazards are increased through removal or reduction of effective ground cover. These hazards are defined as follows:

Slight – Erosion is unlikely under normal climatic conditions.
Moderate – Some erosion is likely; control measures may be needed.
Severe – Erosion is very likely; control measures for vegetation re-establishment on bare areas and structural measures are advised. (USDA NRCS 1998).

For this analysis the TBNG is divided into three primary analysis areas: Spring Creek Assessment Area, Thunder Basin Analysis Area and Inyan Kara Analysis Area

Spring Creek Assessment Area

The Spring Creek Assessment Area includes about 48,740 acres of lands managed by the Medicine Bow-Routt National Forests, Thunder Basin National Grassland in the Spring Creek Geographic Area north of Gillette, WY. (T53N-56N, R68W-71W).

A determination of highly erodible land and areas with high erosion hazard was done. Soil mapping units with a soil erodibility factor (K-factor) of .30 in the surface layer were placed in this group. K-factors for this assessment were obtained from the Soil Survey of North Campbell County Wyoming, northern part.

Sheet and rill erosion hazard ratings are as follows: Severe – 82%, Slight – 13%, and Moderate – 5%. The dominance of severe erosion hazard ratings can be attributed to a preponderance of steep slopes within the analysis area. Suitable grazing lands and lands suitable for prairie dog habitat are primarily on the lower slopes or in riparian areas.

There are about 17,500 acres (36%) of highly erodible lands in the assessment area. The combination of soil material (very fine sand, silt and clay) and the soil permeability combine to make these soil types highly erodible. However, they are only highly erodible when the protective vegetation and soil cover has been reduced to a level that allows for soil impacts.

The next determination is the acres of high erosion hazard. There are about 13,600 acres (28%) or high erosion hazard in the assessment area. This information was collected from the soil survey of the area and field observations. (USFS, 2002)

Thunder Basin Analysis Area

The Thunder Basin Analysis Area, ranging from Bill, Wyoming north to Wright, Wyoming and those lands along Highway 450 up to the junction of Highway 116 including 351,192 acres of National Forest Service (NFS) lands, lying in portions of Campbell, Converse, and Weston Counties (R.66-73W, T37-44N.)

Soil conditions were evaluated as part of the analysis for the Thunder Basin Analysis Area (TBAA). Surface indicators of wind and water erosion were present in almost equal proportions during field examinations of soil surface conditions. Both hazards are increased through removal or reduction of effective ground cover. As a result, erosion hazard rating summaries for the analysis area are presented as a combination of both ratings as derived from published soil surveys. Each soil map unit was assigned a rating hazard based on the most limiting value for each map unit, weighted by component composition (Table 29).

Table 29: Erosion hazard ratings for TBAA allotments

Hazard Rating	Acres	%
Severe	209,707.88	60.4
Moderate	136,383.49	39.3
Slight	998.11	0.3

Soil condition categories reflect existing soil properties resulting from planned and unplanned events. In addition, effective ground cover status was determined via step-point interception at each stop. The following is a description of each soil condition category:

Satisfactory - Indicators signify that soil quality is being sustained and soil is functioning properly and normally. The ability of soil to maintain resource values and sustain outputs is high.

Impaired - Indicators signify a reduction in soil quality. The ability of soil to function properly has been reduced and/or there exists an increased vulnerability to exceed detrimental soil quality standards. An impaired category signals land managers that there is a need for further investigation of the activity area to determine causes and degrees of decline in soil quality. This impaired condition can be a result of inherent and natural site conditions such as: steep slopes, aspects, parent material or past activities. Changes in management practices or other preventative actions might be appropriate.

Unsatisfactory - Indicators signify that loss of soil quality has occurred and soil condition has been detrimentally impacted according to Region 2 and LRMP soil quality standards (FSH 2509.18-92-1). Soils rated in the unsatisfactory category are candidates for improved management practices or restoration designed to recover soil quality. Detrimental soil impacts result in the inability of soil to maintain resource values, sustain outputs, and recover from impacts.

A summary of soil condition classes is presented in Table **30**.

Table 30: Soil condition class summary for TBAA

Condition	Percent
Unsatisfactory	60
Impaired	25
Satisfactory	15

With few exceptions, sampled allotments lacked effective ground cover adequate to prevent wind and water erosion. All visual indicators of wind and water erosion were present within sampled allotments. (USFS, 2007a)

Inyan Kara Analysis Area
Inyan Kara Analysis Area lies in portions of Weston and Niobrara Counties, Wyoming (Townships 41 – 48 North, Ranges 62 – 68 West). Vegetation resources on approximately 155,000 NFS) acres are covered in this analysis area.

Examination of soils in the Inyan Kara Analysis Area (IKAA) was completed as part of the Inyan Kara Vegetation Analysis. Soil condition class was evaluated on approximately one third of the allotments in the IKAA using the same standards for condition class as described above for three categories: satisfactory, impaired and unsatisfactory. Data indicates the following ratings for soil condition class:

Table 31: Soil condition class summary for IKAA

Condition	Percent
Satisfactory	37.7
Impaired	33.9
Unsatisfactory	28.4

Some areas within the sampled allotments lacked effective ground cover adequate to prevent wind and water erosion. Visual indicators of wind and water erosion were present within some of the sampled allotments. (USFS, 2008b)

3.4.2 Environmental Consequences

Direct and Indirect Effects
A direct effect of prairie dog burrowing activities is exposure of recently excavated soils and bare mounds to wind and water erosion, resulting in accelerated soil loss. A potential indirect effect of long-term prairie dog foraging and clipping, in combination with permitted livestock grazing, is reduced vegetative cover and increased wind and water erosion, also resulting in accelerated soil loss. However, soils and prairie dog relationships and interactions are poorly studied and understood. This includes the effects of prairie dog colonization on soil development (pedogenesis) and surface erosion. Soil mixing (pedoturbation) from prairie dog burrowing is undoubtedly important in soil development (Carlson and White 1987) but the extent that prairie dogs contribute to soil development relative to soil loss from wind and water surface erosion on prairie dog colonies is unknown. Working on a white-tailed prairie dog colony on the

Hutton Lake National Wildlife Refuge in eastern Wyoming, Clark (1970) reported no evidence of increased erosion on the colony and suggested that the benefits from prairie dogs adding organic materials, increasing air and water penetration, and mixing soils might more than offset any accelerated erosion that might occur on a prairie dog colony. While, Nielsen (2005), in his unpublished study indicates as much as 9.5 times more soil erosion from prairie dogs in the Cheyenne River Basin. Koford, 1958 reported that we do not know enough about prairie dog-soil interactions to adequately assess the comparative effects of prairie dog colonization on soil development and erosion rates. This same lack of comprehensive and quantitative information still appears to exist today.

Soil erosion from all lands, including colonized and uncolonized grasslands, are sources of sedimentation into rivers and streams, but as stated previously, there appears to be no published or unpublished references documenting and quantifying comparative erosion rates on and off prairie dog colonies, making it difficult to quantitatively assess soil and sedimentation rates from prairie dog colonies. Also, the highest rates of soil erosion in the northern plains region are attributed to cultivated croplands (USDA NRCS 1996), and when considering the relative amounts of cultivated cropland versus black-tailed prairie dog colonies across much of the project, it seems unlikely that prairie dog colonies are significant sedimentation sources contributing to the impaired watersheds identified above. Another difficulty in quantifying soil erosion rates on and off prairie dog colonies is that vegetation conditions within and between prairie dog colonies are highly variable based on years of colonization (age of colony), concurrent livestock grazing practices and other variables. This variability would have to be considered to accurately assess soil erosion rates on prairie dog colonies. (USFS, 2005)

For the reasons identified above, black-tailed prairie dogs were not identified as significant agents of soil and water degradation in the LRMP FEIS and no further detailed analyses were conducted in this FEIS on the direct, indirect or cumulative effects of the alternatives on soil and water resources and the hydrologic function of watersheds.

3.4.2.1 Alternative 1-No Action

Under the No Action Alternative, prairie dog colonies would be expected to continue to expand at a high to moderate level, with some regulation of the growth by recurring plague events. Some wind and water erosion would be expected to occur in areas where prairie dog colonies have created large bare areas. However, this impact is not expected to be significant or measurable as discussed above.

3.4.2.2 Alternative 2-Proposed Action, Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

Under the Proposed Action Alternative, prairie dog colonies would be expected to continue to expand at a moderate level, with some regulation of the growth by recurring plague events. Some control of colony expansion will limit expansion in some areas. Some wind and water erosion would be expected to occur in areas where prairie dog colonies have created large bare areas. However, this impact is not expected to be significant or measurable as discussed above.

3.4.2.3 Alternative 3-Boundary Management

Under the Boundary Management Alternative, prairie dog colonies would be limited in their expansion to reduce unwanted colonization on private lands with some regulation of the growth by recurring plague events. This impact is not expected to be measurable as discussed above.

Short Term Use-Long Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources

There is no expected loss in long-term productivity under all alternatives.

There are no expected unavoidable adverse effects to soils under any of the alternatives.

There is not likely to be irreversible or irretrievable impacts to soils under any of the alternatives

Cumulative Effects-All Alternatives

Cumulative effects for soil and watershed resources include those activities as described in the chart in the cumulative effects section later in this chapter. Past and current grazing activities, coupled with drought conditions have left some areas with little vegetation cover and more bare ground than desired. Continued growth of prairie dog colonies will exacerbate these conditions. Future changes in livestock grazing will likely help to reduce these impacts. Continued development of oil & gas and coal mining will also contribute to open bare areas that may be subject to accelerated erosion.

Cumulative Effects Summary

Cumulative effects for soil resources are expected to be higher in Alternative 1-No Action than in Alternative 4 –Adjusted Management Area and Limited Rodenticide Treatment and Alternative 5-Additional Category 2 Areas which are expected to be higher than Alternative 2-Proposed Action and lowest in Alternative 3-Boundary Management.

3.5 Heritage Resources

3.5.1 Affected Environment

Known historic properties in this area include prehistoric sites up to several thousand years old and turn-of-the-century ranching and mineral extraction. Prehistoric sites that may be eligible would most likely occur on ridge tops where soil has accumulated or along stream courses where intact layers of cultural deposition may occur.

The cultural resource properties recorded on TBNG reflect approximately 11,000 years of High Plains steppe environment human use. About 15% of the analysis area has undergone some degree of archeological surface examination since the mid 1970s, with over 260 sites found. Individual sites include American Indian encampments, historic trails and wagon roads, and more recent homesteads and pastoral camps. The average site size is less than one-half acre. Only a few of the historic and prehistoric sites recorded in the analysis area are eligible for the National Register of Historic Places, and none are currently listed on the National Register. The most common sites encountered are small, temporary prehistoric hunting camps and historic pastoral camps.

Prehistoric Resources
The recorded prehistoric sites on the grasslands can be classified into types based on their use by prehistoric groups. For the TBNG, several site types have been recorded: open campsites, lithic procurement sites, tipi ring sites, kill sites, butchering sites, etc. The most significant are long-term habitation sites. Sites that contain substantial archeological data are important for scientific research, interpretation, and public education.

Prehistoric peoples are believed to have inhabited the High Plains of northeastern Wyoming, the general location of the TBNG, for at least 11,000 years (see following table).

Table 32. General chronology for aboriginal occupation of the Thunder Basin National Grassland.

Paleoindian Period	11,000 to 7,500 Before Present (BP)
Archaic Period	7,500 to 1800 BP
Prehistoric Period	1800 to 400 BP
Proto-historic Period	400 to 20O BP
Contact Period	200 to 120 BP

Virtually all of the prehistoric sites located on TBNG date from the last 3,000 years. There have been no sites recorded from Paleoindian or Early Archaic periods, but diagnostic points from these earlier periods have been found on the surface as isolated finds. Sites dating to 11,000 years BP (Hell Gap, Casper, and Carter-Kerr McGee) exist north and south of TBNG areas in the Powder River Basin, so there is a potential for the location of Paleo and Early Archaic sites on the TBNG. Such sites are often hard to identify because they are usually covered by several feet of overlying sediments.

Historic Resources
The historic record for TBNG begins with the early travelers who traversed the area to explore and establish transportation routes. The Powder River and North Platte River valleys, just to the west and south of the grasslands, were investigated in the early 1800s by Canadian fur companies from the north and by eastern pioneers. In 1812, Robert Stuart discovered an overland route between St. Louis and Oregon. Explorers made their way into the grasslands by the mid 1800s following the Cheyenne River north to the Black Hills. The Raynolds Expedition arrived in 1859 and James A. Sawyer Wagon Road Construction Crew in 1876.

It wasn't until the early 1900s that people started to homestead the grasslands. The Homestead Act of 1909 and the Stock Raising Homestead Act of 1916 allowed settlers to file on 320 and 640 acres of public land. Dry farming was attempted, but most farmers had to also rely on livestock (mainly sheep) to get by. Small homesteads continued to spring up on the grasslands until the Depression in the 1920's and '30s. The environment of eastern Wyoming, however, was so marginal that five years of consecutive drought in the early 1930s, combined with the economic hardships of the Great Depression, forced many homesteaders to abandon their property. In 1934, the U.S. Government began repurchasing the abandoned homesteads under the Bankhead-Jones Farm Tenant Act. The Soil Conservation Service administered the public land on the TBNG until 1954 when the Medicine Bow National Forest took over management.

There are two known Traditional Cultural Properties in the analysis area, but this does not mean that others do not exist.

All undertakings (as defined in 36 CFR part 800.16[y]) are conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended. Heritage resources listed on or eligible to the NRHP are avoided during the implementation phase of any new ground disturbing project proposed on the Forest. If a resource cannot be avoided, mitigation measures are applied to resolve any potential adverse effects to the resource.

If any new and unforeseen ground disturbing activities are proposed as a result of this proposed plan, such as wood post fence construction, the activity would be treated as a separate and distinct undertaking, triggering its own Section 106 process.

3.5.2 Environmental Consequences

A proposed action would be considered significant if it resulted in an "adverse effect" (as defined in 36 CFR part 800.5) to a property that is listed on, eligible for, or potentially eligible for listing on the National Register of Historic Places (NRHP). Potential adverse effects can usually be mitigated through site-specific measures.

Prairie dog management activities in the alternatives have no potential to directly or indirectly affect heritage resources in the project area. None of the tools, including rodenticide use, live trapping, regulated prairie dog shooting, vegetation management, livestock grazing coordination, or landownership adjustment, involve significant new ground disturbing activities. Since the alternatives would not affect heritage resources, it would not change the current condition of heritage resources on the Forest, and it would not move it towards or away from the desired condition as described in the LRMP. For these reasons, no further analyses were conducted on the direct, indirect or cumulative effects of the alternatives on heritage resources in the project area.

3.6 Social and Economics

3.6.1 Existing Conditions

Social

Although individuals and communities over the region use the TBNG, this report would concentrate its affect to the local area of Campbell, Converse, Crook, Niobrara and Weston Counties, Wyoming. Ranching has a long history in the local communities dating back to the 1800s. The use of the National Forests has been an integral part of the management of these ranches for years and contributes to the viability of their agricultural operations.

Population trend- Douglas population grew 4.2% from 1990 to 2000, and Newcastle's grew 8.5% from 1990 to 2000. The populations of the five counties on the TBNG have increased 6.8%.

Economic
The final environmental impact statement (NGP FEIS) for the Northern Great Plains Management Plans (includes Thunder Basin National Grassland Land and Resources Management Plan) presents data and analysis on the employment, income, economic diversity, and dependency and 25% Payment Funds for each county within a zone of influence. The zone of influence includes Campbell, Converse, Crook, Niobrara, and Weston Counties in Wyoming. See the Economics section of Chapter 3 of the NGP FEIS for a description of the employment composition and the affect or potential effect on each county due to management of the TBNG . Economic uses of the project area include: livestock grazing, oil, gas, mineral leasing, recreation and tourism. These uses provide both employment and income to local community.

Legal and administrative framework
Social
NEPA requires the integrated use of natural and social sciences in all planning and decision making that affect the human environment. The human environment includes the natural and physical environment and the relationship to that environment (40 CFR 1508.14). Forest Service land planning requires the integration of social science knowledge into the forest and regional planning process (36 CFR 219.5).

Economics
Economic analysis is required and/or supported by several acts (per FSM 1970.1). The Multiple Use Sustained-Yield Act of 1960 has direction to manage resources for the greatest good over time necessitating the use of economic and social analysis in determining management of the National Forest System. The National Environmental Policy Act of 1969 requires identification and analysis of economic and social impacts of proposed agency actions. The Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, establishes the requirement to consider economic effects in the land management planning process and in the development of the Resource Program and Assessment. Title 36 Code of Federal Regulations, Part 219, provides guidelines for evaluating alternatives in Land and Resource Management Plans and requires consideration of economic and social factors. FSM R2 supplement states conduct an economic benefit-cost and a financial revenue-cost analysis on all resource projects for which an: EA or EIS is prepared. Quicksilver is used to analyze both.

Determination of Economic and Financial Efficiency
The main criterion used in assessing economic efficiency is Present Net Value (PNV), which is defined as the value of discounted benefits minus discounted costs. An economic analysis includes all outputs and costs, including timber, grazing and recreation for which monetary values are available. The monetary values include both market and non-market values, where available. A financial efficiency analysis was also completed to determine the financial returns (revenues) of each alternative. A financial efficiency analysis is the PNV of agency revenues and costs.

To calculate PNV, a software program named Quick Silver was used. This is a PC window based program and serves as a tool to evaluate management investments. Analyses are based on project alternatives that describe costs, revenues and scheduling of management activities. There is a Forest Service cost associated with this project (proposed action) and all of the alternatives to the proposed action. For all alternatives the economic efficiency (benefit-cost) analysis is the same as the financial efficiency (revenue-cost) analysis. The Quick Silver program provides analysis of the implementation costs, which are required for an EIS or EA by Forest Service Manual (FSM 1970.61, R2 supplement). Benefits are not included in the analysis because monetary benefits in providing habitat for wildlife species are difficult to estimate. There are inherent benefits to the public in providing habitat that is not

The economic and financial efficiency analysis table below (Table 33) displays the PNV for each alternative for the 10 year time period following implementation of each alternative. All monetary values are expressed in constant dollars with no allowance for inflation. A 4% discount rate was used. The reduction of PNV in any alternative as compared to the most efficient solution is the economic trade off, or opportunity cost of achieving that alternative.

Alternative 1 includes costs for costs for plague management (dusting), prescribed burning, translocation, and visual barriers, Alternative 2 includes costs for plague management (dusting), estimated rodenticide use, prescribed burning, translocation, and visual barriers, Alternative 3 includes costs of plague management (dusting), estimated rodenticide use and fencing required to exclude grazing from the ½ mile buffer, prescribed burning, translocation, and visual barriers, Alternative 4 includes costs for plague management (dusting), estimated rodenticide use, prescribed burning, translocation, and visual barriers, and Alternative 5 includes costs for plague management (dusting), estimated rodenticide use, prescribed burning, translocation, and visual barriers.

Costs were figured based on the estimated costs as shown in Table 8 at the beginning of Chapter 3 above.

Tool	**Cost**
Prescribed burning	$37/acre
Translocation	$6000/acre
Visual Barriers	$72,429/mile
Plague Management (dusting)	$27.90/acre
Rodenticide Use	$10/acre
Fencing	$3500/mile

3.6.2 Environmental Consequences

Table 33: Economic and financial efficiency analysis-Federal costs (2010-2020)

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Present Net Value	**-$2,735,295**	**-$2,449,861**	**-$4,205,438**	**-$3,936,188**	**-$2,769,273**

3.6.2.1 Alternative 1-No Action

Social and Economic
Direct and Indirect effects
In these alternatives there would be no change. This alternative would not effect on social systems or economics.

While these alternatives do not change the social systems or the economics of the area, these alternatives do not present socially acceptable management of prairie dog populations due to the reduced effectiveness of non-lethal control methods. These alternatives are not likely to gain or maintain landowner support for prairie dog management in the area or for future black-footed ferret reintroductions. Further they would not gain landowner support for completing the Non-essential/Experimental designation under the ESA 10J Rule.

3.6.2.2 Alternative 2-Proposed Action, Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment, and Alternative 5-Additional Category 2 Areas

Social
Direct and Indirect Effects
There would likely be no change from the current social situation due to Forest Service action.

While these alternatives do not change the social systems of the area, these alternatives do present socially acceptable management of prairie dog populations with the use of lethal control methods in addition to non-lethal control methods. These alternatives are likely to gain and maintain landowner support for prairie dog management in the area or for future black-footed ferret reintroductions. Further they would gain landowner support for completing the Non-essential/Experimental designation under the 10J Rule.

Economic
Direct and Indirect Effects
There maybe a slight increase in income due to the possible increase in forage for livestock due to the control of prairie dogs. However, in the short term, until vegetation reached high structure there would be less forage available. This could be an adverse short term effect to operator economics by reducing AUMs.

Alternative 2 is the least costly of the action alternatives to implement because it optimizes the use of the cheaper rodenticide with the more costly management tools of translocation, visual barriers and plague management (dusting).

Alternative 4 is higher in cost than Alternatives 2 and 5 due to the emphasis on translocation, prescribed burning and visual barriers, even though rodenticide use is lower in this alternative.

Alternative 5 is lower in cost than Alternative 4 but slightly higher in cost when compared to Alterative 2. This is due to the need for additional visual barriers in relation to the additional category 2 management areas, due to anticipated conflicts of managing these as bounded areas, rather than individual colonies.

Table 33 indicates that Alternative 2 are more economically efficient; however, most environmental benefits can not be quantified.

When evaluating trade-offs, the use of economic efficiency measures is one tool used by the decision maker in making the decision. Many things cannot be quantified, like effects on wildlife, water quality, forest health, etc. The deciding official takes these and many other factors into account in making the decision.

3.6.2.3 Alternative 3-Boundary Management

Social

Direct and Indirect Effects

By not allowing grazing in the ½ mile buffer, forage will be reduced until high structure is achieved. This could be an adverse short and long term effect to individual operators by reducing AUMs. This could result in some individual operators going out of business. Although some operators could go out of business, this is not likely to have a significant impact to the social systems in the area.

While this alternative does not change the social systems of the area, this alternative does present socially acceptable management of prairie dog populations from the local landowner perspective. However, this alternative is not socially acceptable from the conservationist perspective.

Economic

Direct and Indirect Effects

There maybe a slight increase in income due to the possible increase in forage for livestock due to the control of prairie dogs. However, in the short term, until vegetation reached high structure there would be less forage available. Under Alternative 3, if vegetation in the half mile buffer is in early seral status the species composition is generally not conducive to developing high structure. By not allowing grazing in the ½ mile buffer, forage will also be reduced until high structure is achieved. This could be an adverse short and long term effect to operator economics by reducing AUMs. This could result in some individual operators going out of business. Although some operators could go out of business, this is not likely to have a significant impact to the economics of the area as a whole.

Alternative 3 is the highest in cost due to the large amount of rodenticide use and fencing that would be needed to implement the alternative. In addition, there would be a heavy emphasis on prescribed burning, translocation and plague management (dusting) in the prairie dog habitat within the MA 3.63 that is further than ½ mile from private land boundaries to maintain the remaining prairie dog colonies.

3.6.2.4 All Alternatives

Geographic scope is the counties listed above. The temporal scope looked back a decade and forward approximately 5 years. The area analysis includes all the cumulative effects listed in the cumulative effects chart.

No alternative would have a significant effect directly or indirectly on the social or economic status of the area. There is no irreversible or irretrievable commitment of resources under any of the alternatives.

Cumulative Effects
Cumulative effects on economic and social systems are hard to judge. Recreation (including prairie dog shooting) is very small, unmeasureable and insignificant effect on any of the counties' income. Social systems tend to change with or without any action on the part of the Forest Service. Implementing any alternative may change the social system for recreation. However, any alternative would probably have little effect on the social system of recreation. In all alternatives user conflicts would continue, users of legal trails and users making their own illegal trails are unlikely to change.

Based on the individual resource cumulative effects above, Alternative 1 has the fewest cumulative impacts. Alternatives 2, 4, and 5 have similar cumulative impacts which differ from Alternative 3.

Environmental Justice
A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice. As in Executive Order 12898 (Federal action to address environmental justice in minority populations and low-income populations), provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations".

Statistics from the National Resources Information System (human module) are shown on the table below.

Table 34: Percent of Minority Families and Percent of families under the Poverty level in the project area.

*County	% minorities	% poverty per families
Campbell	3.9	3.1
Converse	5.2	9.2
Crook	2.1	7.8
Niobrara	4.7	10.7
Weston	3.8	5.8

Both minorities and poverty percentage is very low; therefore, no adverse effects to minorities or low-income populations are likely to occur. No minority or low-income communities or groups would be disproportionately affected by any alternative.

3.7 Minerals

Desired Conditions

LRMP Grassland-Wide Direction

Goal 2: Multiple Benefits to People, the Objective for Mineral and Energy Resources which applies to Travel Management is: 2. Honor all valid existing legal mineral rights (LRMP pg. 1-6). This focuses the management activities of the US Forest Service related to solid mineral and oil and gas operations on grassland to ensure that coal, oil, gas, and mineral material operators able to develop valid mineral rights (coal, oil and gas leases; mineral material surface mines) and complete daily maintenance and operation activities.

3.7.1 Existing Conditions

Conventional Oil & Gas and Coal Bed Natural Gas
On FS land managed as the TBNG, there are currently 446 active conventional oil, natural gas, and coal-bed natural gas wells. In addition, there are approximately 30 inactive wells that are in various stages of reclamation. Each of these wells is associated with, on average, 0.5 miles of road that is solely used for accessing those wells for daily operation and maintenance activities. Assuming that each well and its 0.5 mile of access road represent an average disturbed area of 2.5 acres, the total area currently disturbed by and allocated for the use of oil and gas operations on TBNG is approximately 1,190 acres.

Under the 2002 ROD for the LRMP made 432,940 acres of NFS lands east of the Wyodack Coal outcrop available for oil and gas leasing and deferred leasing on the 58,460 acres of NFS lands west of the Wyodak Coal Outcrop pending completion of the Powder River Basin Oil and Gas Project (PRB-EIS). On August 2, 2006, Mary H. Peterson signed the ROD for the Available Lands Oil and Gas Leasing West of Wyodak Coal Outcrop. This decision made the remaining 58,460 acres of NFS lands available for leasing. All of these lands are subject to additional stipulations to be applied to any new leases. Specific stipulations are found in Appendix D of the LRMP.

Two stipulations apply to MA 2.1 and MA 3.63 (Category 1). They include a timing limitation (TL) and a Controlled Surface Use (CSU). These stipulations apply on 55,020 acres of NFS lands within MA 2.1 and MA 3.63.

Black-footed Ferret Habitat Timing Limitation (TL)
Surface use is prohibited from March 1 through August 31 within 0.125 mile (line of sight) of prairie dog colonies occupied or thought to be occupied by black-footed ferrets.

Black-footed Ferret Habitat Controlled Surface Use(CSU)
Operations in prairie dog colonies known or thought to be occupied by black-footed ferrets are subject to the following constraints:

- Limit oil and gas development to no more than one location per 80 acres.
- Suitable black-footed ferret habitat lost as a result of new facilities within prairie dog colonies must be replaced within 1 year.

- Access for routine maintenance of oil and gas facilities in prairie dog colonies is limited to daylight hours. This does not apply to emergency repairs.
- If it's necessary to place a new road in a prairie dog colony, align the road to minimize habitat loss.

There are currently 512 existing leases on the TBNG with approximately 392 in producing status. Thirty (30) of these leases are located within the MA 3.63. These existing leases are not subject to the lease stipulations outlined in the 2001 LRMP and would be developed under the lease stipulations as listed on those leases. Approximately 33 leases have been issued with 2001 LRMP stipulations with only one (1) lease located within the MA 3.63 including the Black-footed ferret stipulations (TL and CSU). One additional lease within the MA 3.63 has been sold and is pending issuance.

Solid Minerals: Coal and Mineral Materials
Solid minerals development activities currently comprise five large coal surface mining operations ranging in areal footprint from approximately 14,000-45,000 acres, and several significantly smaller mineral materials clinker (locally termed "scoria") surface pits, each less than 5 acres in extent.

Coal mining operations (Jacobs Ranch Mine, Black Thunder Mine, North Rochelle Mine {to be replaced by School Creek Mine}, North Antelope-Rochelle Mine, and Antelope Mine) are confined to Management Area 8.4, designated for Mineral Production and Development activities. Coal products are transported off-site by railroad. The progression of mining is generally from east to west, following the westerly dipping mined coal seams. A small number of mineral materials clinker mines are dispersed across the TBNG, both inside and outside of the Mineral Production and Development Management Area 8.4. The mines are small community pits; disposals are infrequent and generally small free-use quantities (less than 10 cubic yards per year). There are currently no coal mining or mineral material operations within the MA 3.63.

3.7.2 Environmental Consequences

3.7.2.1 Alternative 1-No Action

Under Alternative 1, Minerals operations would be allowed to continue as described in the LRMP. Current leases would only be subject to those stipulations as described on the lease. No changes would be made to the MA 3.63 boundary. New leases within the MA 3.63 would be subject to lease stipulations for protection of the Black-footed ferret as described in Appendix D of the LRMP.

3.7.2.2 Alternative 2-No Action and Alternative 5-Additional Category 2 Areas

Under Alternatives 2 & 5, Minerals operations would be allowed to continue as described in the LRMP. Current leases would only be subject to those stipulations as described on the lease. The MA 3.63 boundary would be changed as described in the proposed action. Ten (10) current leases would be removed from the MA 3.63 as modified, but two (2) leases would be added for a total of 22 current leases remaining within the MA 3.63. The one (1) lease that was issued with

the 2001 LRMP stipulations for black-footed ferrets would remain within the MA 3.63. New leases within the MA 3.63 would be subject to lease stipulations for protection of the Black-footed ferret as described in Appendix D of the LRMP. Under these alternatives slightly more acres would be subject to Black-footed ferret stipulations. This would limit oil and gas development in this area more than the no action alternative, although this is not expected to be substantial.

3.7.2.3 Alternative 3-Boundary Management

Under Alternatives 3, Minerals operations would be allowed to continue as described in the LRMP. Current leases would only be subject to those stipulations as described on the lease. No changes would be made to the MA 3.63 boundary. New leases within the MA 3.63 would be subject to lease stipulations for protection of the Black-footed ferret as described in Appendix D of the LRMP.

3.7.2.4 Alternative 4-Adjusted Management Area and Limited Rodenticide Treatment

Under Alternatives 2 & 5, Minerals operations would be allowed to continue as described in the LRMP. Current leases would only be subject to those stipulations as described on the lease. The MA 3.63 boundary would be changed as described in the proposed action. Two current (2) leases would be added for a total of 32 current leases within the MA 3.63. The one (1) lease that was issued with the 2001 LRMP stipulations for black-footed ferrets would remain within the MA 3.62. New leases within the MA 3.63 would be subject to lease stipulations for protection of the Black-footed ferret as described in Appendix D of the LRMP. Under this alternative approximately 9,000 additional acres would be subject to Black-footed ferret stipulations. This would limit oil and gas development in this area more than the other alternatives, although this is not expected to result in a substantial loss in oil and gas development.

Table 35: Impacts to Oil and Gas Leases by Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Current Leases within MA 3.63	30	22	30	32	22
NFS lands with BFF Stipulations	55,020 acres	55,386 acres	55,020 acres	64,541 acres	55,386 acres
Current Leases with BFF Stipulations	2*	2*	2*	2*	2*

* 1 lease has been issued and 1 additional lease is sold and pending issuance.

Cumulative Effects Common to All Alternatives
Limitations to oil and gas development for resource protection as described in the LRMP would apply to all new leases regardless of the alternative. None of the alternatives would have a substantial impact on oil and gas development; therefore there would not be any additional cumulative impacts from any of the alternatives.

Short-term Uses and Long-term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Wildlife

There is no expected loss of long term productivity under Alternative 1, 2, 4, and 5. It is likely that there will be a loss of long term productivity for prairie dogs and other sensitive species associated with prairie dog habitat under Alternative 3 as implementation of this alternative would likely impact these species and move them in a trend toward federal listing or loss of viability.

Botany

There is no expected loss in long term productivity from any of the alternatives.

Vegetation

Under Alternative 1 and 4 there could be loss of long-term productivity in vegetation communities due to conversion from later seral stages to earlier stages as prairie dog colonies expand. There is no expected loss in long-term productivity under Alternatives 2, 3, 4 and 5.

Soil

There is no expected loss in long-term productivity under all alternatives.

Social and Economics

There is no expected loss in long term productivity from any of the alternatives.

Minerals

There is no expected loss in long term productivity from any of the alternatives.

Unavoidable Adverse Effects

Wildlife

There are no expected unavoidable adverse effects under Alternative 1, 2, 4 and 5. There are unavoidable adverse effects for prairie dogs and other sensitive species associated with prairie dog habitat under Alternative 3 as implementation of this alternative would likely impact these species and move them in a trend toward federal listing or loss of viability.

Botany

There are no expected unavoidable adverse effects from any of the alternatives.

Vegetation

There are no expected unavoidable adverse effects to vegetation under any of these Alternatives.

Soil

There are no expected unavoidable adverse effects to soils under any of the alternatives.

Social and Economics

No alternative would have a significant effect directly or indirectly on the social or economic status of the area.

Minerals

There are no expected unavoidable adverse effects to soils under any of the alternatives.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

Wildlife

There are no expected irreversible or irretrievable commitments of resources under Alternative 1 and 2, 4, or 5. It is likely that there will be an irretrievable commitment of resources for prairie dogs and other sensitive species associated with prairie dog habitat under Alternative 3 as implementation of this alternative would likely impact these species and move them in a trend toward federal listing or loss of viability.

Botany

There are not expected to be any irreversible or irretrievable impacts (loss of occurrence) from any of the alternatives. The character of potential habitat won't be changed by the alternatives, so there are no irreversible or irretrievable impacts to potential habitat for any of the analyzed species.

Vegetation

There are no expected irretrievable or irreversible impacts for any of these Alternatives.

Soil

There is not likely to be irreversible or irretrievable impacts to soils under any of the alternatives.

Social and Economics

There is no irreversible or irretrievable commitment of resources under any of the alternatives.

Minerals

There is not likely to be irreversible or irretrievable impacts to soils under any of the alternatives.

Cumulative Effects

Table 36: Cumulative Effects Chart
THUNDER BASIN NATIONAL GRASSLAND
Present date is 2009

PAST	PRESENT	FUTURE
Dispersed recreation	Dispersed recreation	Dispersed recreation
Grazing	Grazing	Grazing
Roads	Roads	Roads
Wildfires	Wildfires	Wildfires
1. Seismo testing		
2. Oil Wells	2. Oil Wells	2. Oil Wells
3. SUP	3. SUP	3. SUP
4. Natural gas	4. Natural gas	4. Natural gas
5. Range improvements	5. Range improvements	5. Range improvements
6. Recreation facilities	6. Recreation facilities	6. Recreation facilities
7. Prescribed burn/Fuels	7. Prescribed burn/Fuels	7. Prescribed burn/Fuels
8. Travel Management	8. Travel Management	8. Travel Management
9. Enduro race	9. Enduro race	9. Enduro race
10. Turner Res. Reclamation Plan		
11. Abandon mines rehabilitation	11. Abandon mines rehabilitation	11. Abandon mines rehabilitation
12. Coal Mining	12. Coal Mining	12. Coal Mining
13. Teckla Distribution Substation	14. Vegetation management	14. Vegetation management

Dispersed recreation-*Spring Creek***-**Heavy concentrated ATV use in the Weston area (T54N, R70W, Sections 23-26). Use by ATV's, dirt bikes and mountain bikes in the analysis area, more on the west side. There is low off road use outside of the Weston area. Other uses include horseback riding, hiking, target shooting and camping. Some concentrated area high trash concentration. *Rest of TBNG*- Use all year light, heavy in hunting season (Sept to Nov.). Activities are 4-wheeling, camping, scenic and wildlife viewing, trapping, hiking, train spotting, and horseback riding. There are 500 dispersed camping sites. No system trails or developed recreation areas.

Grazing-Season- Most grazing allotments are year around.

Head months and type of livestock-Livestock includes cows, sheep, horses and buffalo, totally 139,654 head months yearly.

Fences, etc.- Improvements include miles of fenceline, pipeline, wells/springs, reservoirs/dugouts totaling 2,241 on the TBNG.

History: Homesteaded in the 20th century, some ranching or small gain farms. Drought in 1920' and 1930's, in part caused many homesteads to fail. Cattle grazing remained steady, while sheep grazing decreased since the 1960's.

Non-NFS Ownership: Surrounding area land owners are mostly ranchers. Also a large amount of adjacent land is involved in oil and gas or coal mining.

Railroad: Future railroad construction in the project area includes 46.1 acres. T38N, R70W, Sections 17, 18, 20; T39N, R70W, Section 18, 19; T39N, R71W, Sections 2, 11-13, 24; T40N, R70W, Section 6; T40N, R71W, Sections 1, 12-14, 35. Current miles are 9 miles in Thunder Basin Grazing Association and 4.5 acres in Inyan Kara Grazing Association as of 4-4-07.

Road density-*Spring Creek***-**Use is high on the west side and medium on the east side. *Rest of TBNG*- Generally this area has high road density. Locally it is rated high around oil, gas, and coal mining areas. Other areas in the project area maybe medium to low, especially the roadless. No level 4 or 5 roads. The Rap for the grasslands predicts 31.5 miles of road construction for oil and gas. Roads around the mine will be mined through and relocated. The mines will abandon 29 miles of roads, construct 6.8 miles, upgrade 3.1 miles and pave 7.3 miles.

Social and Economic: Trend in the area is moving from a ranching type community to an energy based community. Drought conditions may reduce the ranching economics.

Wildfires- From 1970 to 2000 there was: 15 fire up to .25 acre, 76 fires .26 to 9.9 acres, 60 fires 10-100 acres, 9 fire 100-499 acres, 14 fire 500-999 acres, 3 fire 1000-4999 acres 2 over 5000+, 10 historic large fires (acres not calculated) and in 2005 and 2006 2 large fires (acres not calculated).

1. Ballard Little SW 2-D Seismo Data Gathering. Minerals. T55N, R70W, Section 11. Also includes T55N, R69W, Section 30. Implementation spring 2003. Collect seismographic data along 6.05 miles of line by drilling 16 shot holes per mile and charge detonation in each side. Approximately 2.7 miles of shot line would occur in Duck Creek IRA. Project was named Reliable Seismic project.

2. Oil and Gas Activities (Minerals): *Spring Creek*-Access roads associated with these leases are considered under the roads part. Past: The first well was drilled in 1952 on Forest Service land and in1949 on other ownership. Past wells include 139 wells (236 acres) on Forest Service and 141 wells (240 acres) on other land owners. These wells are plugged, abandoned and being reclaimed or have been reclaimed (high percentage).
Present: As of 2-14-07 there are 27 wells (46 acres) on Forest Service and 38 wells (65 acres) on other land owners that are active.

TBGA- Past: The wells started to be drilled in 1953 on NFS lands and 1924 on adjacent lands.
Present: There are 2219 active wells in the project area (including non NFS lands), and 794 inactive wells. Total disturbance acres are 994 on NFS and 4131 on non NFS lands.

Future for all TBNG: The BLM's reasonably foreseeable development predicts that in the next 10 years there will be 217 exploratory wells, 140 producing wells, and 120 reclaimed acres, 285 acres of short term disturbance and 18 acres long term.
A. Ballard Oil Well #12-6. T54N, R69W, Section 6. Project includes 3 acres for one oil well, including .2 miles of new access road, underground electricity and waterline.
B. Ballard Petroleum Holdings, LLC Wildhorse Creek Field Development. T54N, R69W, Sections 17, 18, 19, 20. Project is 5 conventional oil wells with >15 miles of new roads. Disturbance includes 23.68 acres short term and 18.88 acres long term disturbance. Not implemented as of 1-22-07.
C. Ballard Petroleum oil well APDs. T54N, R69W, Section 31. Project includes wells #32-31 and #21-31. Project implementation prior to10/2003.
D. Ballard-Shorty Draw Unit Wells #12-14 and #13-7. T55N, R70W, Section 14. Also with T55N, R69W, Section 7. Project includes 3.8 acres for the well pads, 1950' new road and 8.5 miles of upgraded road. NEPA currently in progress.
E. Ballard Spring Ck Oil well, Federal #11-11. Section 11. Drill and operate 1 conventional oil well with less than 5 ac.
F. Ballard Wildhorse Oil Well, Federal #3-18. T54N, R69W, Section 18. Drill and operate 1 conventional oil well with less than 5 ac. Project also includes #2-18 in Section 18. Drill and develop conventional oil well and related facilities.
G. Black Hills Exploration Grieves Oil Wells. 2 oil wells. 3 acres. T42N, R64W, Section 30.
H. Cabin Draw Unit Well #31-29. Project includes one oil well 1.6 acres, 1010' new road. T54N, R69W, Section 29. NEPA in process as of 1-22-07.
I. Camp Creek Federal oil wells 12-8 and 41-7
T54N, R70W, Sections 7 and 8. Drill and develop 2 conventional oil wells. Project implemented 10/2005. Disturbance is about 5 acres.
J. Gulf Oil Wells Federal #4-27 and #8-28. Implementation-on hold. Drill, develop, and operate 2 conventional oil wells. Section 27.
K. Gulf oil wells federal #15-21, 4-27 relocated. Section 22.Implmentation-spring 2004. Drill, develop and operate 2 conventional oil wells.
L. **M&K Oil Co. Pollare Gov't Well #15-3**. **#15-4**. T42N, R65W, Sec 15, SW1/4, SE ¼. Conventional oil well. Also Sec 15, SW ¼, SW ¼. Implementation was 6/2004.
M. Trend Exploration I, LLC-Flat Creek Federal Well #44-6. T54N, R69W, Section 6. Project includes 1 oil well pad with upgrading .3 miles of existing roads, and .1 mile of new road. The project disturbance is less than 5 acres. Decision signed 12-8-06.
N. Yates Petroleum, Duck Cr. Fed. #1 ADP. Implementation Spring 2002. Sections 11-13, 22-24, and 34-35. With T42N, R70W; T41N, R71W; T41N, R70W. APD to drill 202 gas wells and develop related facilities.
P. Yates Petroleum Federal #1 Well ADP. Implementation 10/2004. Drill exploratory oil well.

3. SUP
Total special use permits excluding outfitter guides (ground impact same as recreation users) is 1225 on the TBNG. Some permits closed as early as 1996 to close in 2034.

4. Natural Gas-Minerals

A. Big Porcupine CBM. Sections 1, 3, 12-13. With T42N, R71W; T41N, R70W; T42N, R70W. Drill 202 CBM wells and related facilities. Name was changed to Independent Energy CBM-260 well APD. Number of wells increased to 260.
B. Coleman Oil and Gas Coal Bed Natural Gas Well Plan of development(Antolope Flats). One oil well, 1000' underground utility corridor, 2 track 16 wide and one drilling pad 100'X100'. .6 acres.
C. Merit South Porcupine CBNG Project. Implementation 8/2004. 2 wells.
D. Prima Porcupine North and South Tuit CBM project. Minerals. Sections 13 and 23-25. With T42N, R72W. Implementation-spring 2004. Drill and develop 26 CBM wells and related facilities.
E. Coleman Porcupine CBM Project. Section 2. Implementation prior to 10/2003. Drill and develop 4 CBM wells(CE) less tan 5 acres.
F. Westport Oil and gas, Nicholson CBNG POD. T43N, R71W, Sections 19 and 30. Also with T43N, R72W, Section 14. 10 coal bed natural gas wells. Acres 760.
FG Yates Dragline CBM Project. Sections 19 and 30. Implementation prior to 10/2003. Develop and operate 3 CBM wells in under 5 acres.
H. Yates Petroleum Corporation Marine Coal Bed Natural Gas Development Project. T41N, R72W, Sections 17, 22, and 29. 640 acres. 8 CBNG including roads, gas and water pipeline. Implementation?
I. Yates Thunder Basin CBM Wells POD. T42N, R71W, Sections 7-9, 17, 18. Implementation 10/2004. With R70W. Section 12 and 13. 10 CM wells and necessary facilities. 1 well involves split estate. 835 acres.

5. Range Improvements. Livestock waters average approximately 1/4 acre. The first water was installed in before the area became National Grassland and may continue as needed.
A. Featherston and Gorsuch Pasture Water Wells. T39N, R70W, Section 33. Implementation winter 2005-2006. With T38N, R70W, Section 24. Drill 2 new water wells and install 4 new stock tanks. Ground disturbance .3 acres.
B. Grieves Allotment pipeline and tank. Implementation-spring 2004. Construct a pipeline and watertank. Section 26.
C. Love Sol Project. T44N, R68W, Section 11. Drill water well and place a watering trough. Trench 220' of ground for the pipeline. Solar panels will disturb 100 square feet. Drilling of the well will disturb 7,000 square feet.
D. M-Creek Pasture Improvements Proposal. T40N, R70W, Sections 20-23 and 26-28. 2.5 miles of new fence, 3.25 miles of new water pipeline, drilling 4 wells and installing 10 livestock waters and 1 storage tank.
E. Martins Pipeline and storage tank. Implementation winter 2005-2006. Section 15, NE ¼, SE ¼. 485 feet of underground water pipeline and one 8 foot diameter water tank.
F. Mirich pipeline and tank.T48N, R66W, Sections 11 and 12. .5 miles of pipeline and on 1 stock tank. 1 acre of disturbance. Connects to a well on private land.
G. Sweet Allotment Rangeland Vegetation Management. Sections 24-26. With T48N, R63W. Implementation spring 2004. Develop water sources. Use fences in new and different locations.
H. Sweet Allotment Rangeland Vegetation Management. Sections 19 and 30. With T48N, R64W. Implementation spring 2004. Develop water sources. Use fences in new and different locations.

I. Triplet Pasture Well Project. T55N, R69W, Section 28. One water well. Decision was signed 11-8-04.
J. Upper Antelope/M Creek Range Improvement Project. T40N. R70W. Sec.12. Drill one new water well and install 2 water tanks. Burying a water tank and construct .25 miles of pipeline..7 acres of ground disturbance.
K. Upton-Osage Timber Edge. T47N, R64W, Section 3. Place a 16' cylindrical, 20' tall tank over an existing pipeline. Disturbance area 100 square feet. Implementation in summer 2006.
L. Sauerkraurt Pasture Improvement. Section 17. Implementation-Summer 2004. Install 1.5 miles of water pipe and 3 stock tanks.

6. Recreation facilities. Toilet installed in 2004, approximately ¼ acre of disturbance (T54N, R70W, Section 25). Future plans to gravel parking lots. There is also a picnic site with one table at Soda Well (T54N, R70W, Section 20).

7. Prescribed Burn. 11 units were burned in 1999. Approximately 1,000 acres total. All NFS land.
Upton-Osage Fuels Reduction Project. Fire. Upton is T48N, R65W, Sections 10, 13, 14, 15, also with Osage T46N, R63W, Section 3, 4, also with Clay Spur T47N, R63W, Sections 17, 18, 19, 20. 85 acres of sanitation salvage (overtopped, dead and dying trees), 256 acres of shelterwood (overstory and understory removal), Commercial Thinning 204 acres (remove pole size), 104 acres of Pre-commercial thin (smaller than pole size), understory removal, thinning from below, 75 acres of boundary treatment (trees 50-100 feet from the boundary), 195 acres of broadcast burning (underburn to reduce timber treatment slash).

8. Travel Management for Thunder Basin National Grassland. Travel. System routes and non-system routes have been analyzed for additions, deletions, conversions, and closures.

9. **Inyan Kara Enduro Event Priority SUP**
Recreation. Implementation 7/2004. 5 year permit for a once a year, one day motorcycle race. Near Upton, WY.

10. Turner Reservoir Recreation Plan. Recreation**.** T47N, R63W, Section 21. Signed in1998. Recreational site construction.

11. A. Abandon Mine Reclamation. Minerals. Implementation-On hold. Section 7. Five bentonite mines (with T47N, R65W, Sec 3 and 12; T47N, R64W, Sec. 19). Recontour and reestablishment of more natural meandering drainage patterns. 75 acres disturbance.
B. Abandon Mine Land Reclamation 12D Groups 3 and 6. Minerals. Implementation-summer 2004. Sections 3 and 12. Also T48N, R64W, Sec. 7; T47N, R64W, Sec.19. Reclaim 5 bentonite sites. Recountouring, removing roads and muck pits, stabilizing channels and inlets, and seeding with native seed. 88 acres on private and NFS lands.

12. Coal Mining-Minerals
A. Ark Land Company Coal exploration license. T43N, R71W, Section 23, 26, 35. Drilling 12 locations, 6' in diameter. No road construction.

B. Little Thunder Coal LBA. With T43N, R70W. Develop 640 Acres. Implementation 10/2004.
C. North Antelope/Rochelle LBA. R71W with R70W. Coal lease to develop 1, 740 Acres. Implementation 10/2004. Develop 1,740 Acres on TBNG
D. West Roundup Coal LBA. With R71W. Implementation 10/2004. Develop 580 Acres of coal mine.

13. Teckla Distribution substation. Minerals. Implementation prior to 4/2003. Section 34. Construct and operate electrical power local distribution facility up to 20 years on less than 1 acre.

14. Vegetation management
Thunder Basin Grazing Association area, Inyan Kara Grazing Association Vegetation Management Area EA's and Inyan Kara CE's have been analyzed for compliance with the LRMP. These have been developed under adaptive management including the use of various management tools to reach desired conditions. Implementation is ongoing.

Cumulative Effects Summary

Wildlife

Threatened, Endangered or Proposed Species
The cumulative effects of this project under any alternative in conjunction with other past, present, or reasonably foreseeable future projects in the area are not expected to have significant adverse impacts on wildlife within the analysis area.

Cumulative Effects from Alternative 1-No Action are expected to be lower than Alternative 4-Adjusted management area and limited rodenticide use, which is lower than Alternative 5-Additional category 2 areas, which is lower than Alternative 2-Proposed action due to higher expected use of rodenticide on private lands within the analysis area. Alternative 3 would have the greatest adverse cumulative effects due to anticipated rodenticide use on both federal and private lands.

Sensitive Species
Cumulative Effects from Alternative 1-No Action are expected to be lower than Alternative 4-Adjusted management area and limited rodenticide use, which is lower than Alternative 5-Additional category 2 areas, which is lower than Alternative 2-Proposed action due to higher expected use of rodenticide on private lands within the analysis area. Alternative 3 would have the greatest adverse cumulative effects due to anticipated rodenticide use on both federal and private lands.

Management Indicator Species
Cumulative Effects from Alternative 1-No Action are expected to be lower than Alternative 4-Adjusted management area and limited rodenticide use, which is lower than Alternative 5-Additional category 2 areas, which is lower than Alternative 2-Proposed action due to higher expected use of rodenticide on private lands within the analysis area. Alternative 3 would have the greatest adverse cumulative effects due to anticipated rodenticide use on both federal and private lands.

Other Species of Concern
Cumulative Effects from Alternative 1-No Action are expected to be lower than Alternative 4-Adjusted management area and limited rodenticide use, which is lower than Alternative 5-Additional category 2 areas, which is lower than Alternative 2-Proposed action due to higher expected use of rodenticide on private lands within the analysis area. Alternative 3 would have the greatest adverse cumulative effects due to anticipated rodenticide use on both federal and private lands.

Botany

Threatened or Endangered, and Sensitive Species
Threatened and Endangered Species – Since there is a No Effect call for Ute lady's tresses there are no cumulative effects. Cumulative effects from past present and future actions could exist for Barr's milk-vetch and Visher's buckwheat. The No Action Alternative would not add adverse effects to the existing past, present, or foreseeable future actions. Cumulative Effects for Alternatives 2, 3, 4 & 5 would be identical to Alternative 1.

Species of Local Concern
Cumulative effects from past present and future actions could exist for summer milk-vetch, Astragalus hyalinus. The No Action Alternative would not add adverse effects to the existing past, present, or foreseeable future actions. Cumulative Effects for Alternatives 2, 3, 4 & 5 would be identical to Alternative 1.

Vegetation

Rangeland and Forested Vegetation:
Cumulative effects from past improperly managed livestock grazing practices, wildfires, railroad activity, oil well activity, natural gas/oil pipe-lines, recreation activities, increases in certain wildlife species populations, coal mining, and road construction have resulted in undesirable changes in vegetation communities. Currently improved management of livestock grazing, regulation of off road vehicle traffic, improved energy exploration/extraction techniques and rehabilitation practices, improved wildlife management, and improved road/railroad management have reduced some of the adverse affects, therefore cumulative effects in some cases are currently trending upward (beneficial effect). Coal mines, new roads/railroads, and new oil/gas wells and their pipelines/power-lines will always have an adverse environmental effect of some kind. After-all these activities are removing vegetation in the disturbance areas for the foreseeable future if not longer, even though these areas will be rehabilitated. Some activities such as off road vehicle traffic management, road management, wildlife management, prescribed burning, and grazing management can achieve a beneficial effect. However, all of these activities and Alternative 1 (no action) will not cumulatively add adverse environmental effects. In fact Alternative 1, assuming a reduction in plague activities, will help achieve the LRMP vegetation objectives, especially in the short term. The cumulative effects for Alternatives 2, 3, 4, and 5 would be the same as Alternative 1.

Non-native Invasive Species
Past cumulative actions that have an impact on the risk of invasive species invasion or expansion include unmanaged grazing, wildfires, railroad activity, oil and gas well activities, recreation activities, coal mining, and roads. Any activity that results in sites with a lack of native vegetation, increased bare soil, or an opening in a shade producing canopy is likely to create

niches where there is a potential for non-native invasive species invasion. Currently with improved management practices which include rehabilitation of disturbed areas by reseeding with an approved native seed mix, utilizing livestock to graze on invasive species during their growth cycle, and treatment of non-native invasive species with herbicides have halted the expansion of these species and in some cases, project sites, have reduced density of these species. All ground disturbing activities open up a niche for these species to expand. Therefore it is imperative to include in all future ground disturbing projects stipulations to contain or control non-native invasive species.

Prairie dogs, through their normal activities, will produce a certain amount of bare ground. Bare ground is an open niche for the establishment of non-native invasive species. However, the prairie dog is well known for clipping herbaceous species for food and/or for maintaining sight distance around their burrows. From field reviews, it appears that non-native invasive species, mostly cheat-grass and Japanese brome, expand into prairie dog colonies, however prairie dogs utilize these species as food thereby suppressing these non-native invasive herbaceous species to some degree.

Prairie dog colonies are generally wildfire resistant. This is due to a lack of continuous and/or density of fine fuels. An increase in fire frequency is a major contributor of non-native invasive species, mostly cheatgrass, expansion. Due to the lack of fine fuels within the colonies, it appears that these areas are somewhat fire resistant. The only time non-native species would be expected to increase in density would be if the plague reduced prairie dog densities within the colonies.

Cumulatively this alternative, Alternative 1, will not add any adverse effects to the past, present, and/or foreseeable future activities. Alternatives 2, 3, 4, and 5 have the same cumulative impacts as Alternative 1.

Soils

Cumulative effects for soil and watershed resources include those activities as described in the chart in the cumulative effects section later in this chapter. Past and current grazing activities, coupled with drought conditions have left some areas with little vegetation cover and more bare ground than desired. Continued growth of prairie dog colonies will exacerbate these conditions. Future changes in livestock grazing will likely help to reduce these impacts. Continued development of oil & gas and coal mining will also contribute to open bare areas that may be subject to accelerated erosion.

Cumulative effects for soil resources are expected to be higher in Alternative 1-No Action than in Alternative 4-Adjusted Management Area and Limited Rodenticide use, which is expected to be greater than Alternative 5-Additional Category 2 areas. Alternative 5 is expected to be greater than Alternative 2-Proposed Action and lowest in Alternative 3-Boundary Management.

Social and Economics

Cumulative effects on economic and social systems are hard to judge. Recreation (including prairie dog shooting) is very small, under 10% of the counties income. Social systems tend to change with or without any action on the part of the Forest Service. Implementing any

alternative may change the social system for recreation. However, any alternative would probably have little effect on the social system of recreation.

Based on the individual resource cumulative effects above, Alternative 1 has the fewest cumulative impacts. Alternatives 2, 4, and 5 have similar cumulative impacts which differ from Alternative 3.

Minerals

Limitations to oil and gas development for resource protection as described in the LRMP would apply to all new leases regardless of the alternative. None of the alternatives would have a substantial impact on oil and gas development; therefore there would not be any additional cumulative impacts from any of the alternatives.

Other Required Disclosures

NEPA at 40 CFR 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders."

This document complies with the Final Environmental Impact Statement and Land and Resource Management Plan Revision Record of Decision (ROD) to be amended as proposed.
Other laws and regulations followed:

- Forest Service Manual 2300
- The Soil Management Handbook (FSH 2509.18)
- Watershed Conservation Practices Handbook (FSH 2509.25).
- 36 Code of Federal Regulations 261

The Endangered Species Act of 1973.
Under ESA, federal agencies are responsible for using their authorities to conserve threatened and endangered species, and to assure that their actions do not jeopardize listed species or adversely modify designated critical habitat.

Executive Order 11990.
Protection of Wetlands, directs agencies to avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Known major wetland areas (as defined in Sec 6, (c)), have been protected or managed specifically for the protection of wetland resources in past management strategies and in the proposed action.

Executive Order 12898
Environmental Justice directs agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The proposed action does to not result in high and adverse human health or environmental effects through its programs, policies, and activities on minority populations and low-income populations.

Federal Water Pollution Control Act 1977 (Clean Water Act).
Best Management Practices (BMPs) and Watershed Conservation Practices (WCP) Handbook (FSH 2509.25). State of Wyoming Department of Environmental Quality for compliance with the Clean Water Act.

The National Forest Management Act of 1976.
Mitigation requirements shall be specified (NFMA, 36 CFR 219.17). Standards, guidelines and management directives set forth in the LRMP. Forest Service policy for habitat maintenance for all existing native and desired non-native plants, fish, and wildlife species (FSM 2601.2)

Roadless Areas
Roadless Area Conservation Final Rule, 66 FR 3244 (Roadless Rule), was signed by former Secretary of the U. S. Department of Agriculture Dan Glickman on January 12, 2001.

On July 14, 2003, a Wyoming Federal District Court permanently enjoined the January 12, 2001 roadless rule, prohibiting its application nationwide. Based on that ruling, the Forest Service proposed the 2005 rule which would allow states to petition for roadless areas.

On September 20, 2006, Judge Laporte of the California district court issued an opinion and order setting aside the 2005 State Petition Rule and reinstating the 2001 Roadless Rule. This ruling does not allow approval of any further management activities in inventoried roadless areas prohibited by the 2001 Roadless Rule.

In 2008, a federal district judge in Wyoming held that the 2001 Rule was illegally promulgated and entered a permanent injunction for the express purpose of preventing the Forest Service from following the California court's ruling. To comply with the Wyoming court's order, projects must not take the prohibitions, or the exceptions, of the 2001 Rule into account.

This project contains the following roadless areas:

Table 37: Roadless Areas in the analysis area

Name of the Roadless Area	Acreage
Cow Creek	17,500
Downs	6,510
HA Divide	5,060
Miller Hills	10,370
Red Hills	6,840

All proposed activities in this project comply with current direction for roadless areas. There would be no road construction, reconstruction or timber harvest.

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Brushy Creek Ranch
CA McKee Livestock
CANDO
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D&W Livestock Co
Dilts Ranch Company
Downs Ranch Limited
Joe Driskell Ranch
Dull Center Angus Ranch
Elliott Ranch
Esterbrook Lodge
Flying J Ranch
Grieves Ranch
Guns and Stuff
Iberlin Ranch
Inyan Kara Grazing Association
Irwin Livestock Co.
Jacobs Ranch Coal Co.
JFW Corporation
Johnston Realty
JRJ Ranch Inc.
Keeline Ranch Co.
Leo Perino and Sons
Lissolo Ranch
Livingston Ranch Inc.
Lone Crow Cattle Company
Lone Tree Bible Ranch
Martens Land & Cattle
Nachtman Land and Livestock
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Popham/Reese Partnership
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Powder River Energy Corp.
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Slash 2 Slash Ranch Co.
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APPENDICES

Appendix A: Draft Prairie Dog Management Strategy

1. Black-Tailed Prairie Dog Conservation Assessment and Management Strategy (Alternative 2)
2. Black-Tailed Prairie Dog Management Strategy (Alternative 3)
3. Black-Tailed Prairie Dog Management Strategy (Alternative 4)
4. Black-Tailed Prairie Dog Management Strategy (Alternative 5)

Appendix B: Decision Screens

1. Alternative 1 (No Action)-Decision Screen For Thunder Basin Prairie Dog Strategy
2. Alternative 2 (Proposed Action) & Alternative 5 (Additional Category 2 Areas) Decision Screen For Thunder Basin Prairie Dog Strategy
3. Alternative 3 (Boundary Management) Decision Screen For Thunder Basin Prairie Dog Strategy
4. Alternative 4 (Adjusted Management Area And Limited Rodenticide Use) Decision Screen For Thunder Basin Prairie Dog Strategy

Appendix C: LRMP Amendment and Map

1. LRMP Amendment, changes from current direction under Alternatives 2-5
2. Reasons for Amendment-Alternatives 2-5
3. LRMP Amendment Factors Of Significance Or Non-Significance
4. Amendment Maps-Alternatives 2-5
5. LRMP Amendment Changes Comparison Table

Appendix D: Response to Comments

1. List of Commenters
2. Comments and Responses

Appendix E: Detailed Alternative Comparison Table