



United States
Department of
Agriculture

Forest Service

Region 1

Dakota Prairie
Grasslands

ENVIRONMENTAL
ASSESSMENT
FOR THE
MAAH DAAH HEY II
TRAIL EXTENSION



August 2006

Data Accuracy - The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information, contact: Dakota Prairie Grasslands, 240 W. Century Ave, Bismarck, ND 58503; (701) 250-4443.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326, W. Whitten Building, 1400 Independence Ave. SW, Washington, D.C. 20250-9410, or call (202) 720-5964 (voice and TDD). The USDA is an equal opportunity provider and employer.

ENVIRONMENTAL ASSESSMENT

for the

MAAH DAAH HEY II PROJECT

Billings and Slope Counties, North Dakota



USDA FOREST SERVICE
DAKOTA PRAIRIE GRASSLANDS
MEDORA RANGER DISTRICT

Responsible Official:

Ronald W. Jablonski, Jr.
Medora District Ranger
161 21st Street W
Dickinson, ND 58601-3135

For Further Information Contact:

Jeff Adams, Team Leader
161 21st Street W
Dickinson, ND 58601-3135
(701) 225-5151

Table of Contents

| | |
|--|------------|
| Summary..... | i |
| Chapter 1 Purpose of and Need for Action | 1-1 |
| Proposed Action..... | 1-1 |
| Purpose and Need | 1-2 |
| <i>Project Development</i> | 1-5 |
| <i>Project Area Location</i> | 1-6 |
| Relationship to the Dakota Prairie Grasslands Management Plan | 1-6 |
| <i>Levels of Decisions</i> | 1-6 |
| <i>DPG Plan Direction</i> | 1-7 |
| <i>Decision to Be Made</i> | 1-8 |
| Chapter 2 Alternatives | 2-1 |
| Introduction..... | 2-1 |
| Process Used to Formulate Alternatives..... | 2-1 |
| Public Involvement..... | 2-1 |
| Refining the Proposed Action..... | 2-6 |
| Alternative Descriptions | 2-7 |
| <i>Alternative Evaluation Process</i> | 2-7 |
| <i>Alternatives Considered in Detail</i> | 2-8 |
| <i>Design Criteria</i> | 2-11 |
| <i>Alternatives Considered but Dropped From Analysis</i> | 2-13 |
| <i>Comparison of Alternatives</i> | 2-15 |
| Chapter 3 Affected Environment and Environmental Consequences | 3-1 |
| Introduction..... | 3-1 |
| Recreation | 3-2 |
| Wildlife | 3-17 |
| Botany..... | 3-25 |
| Soil and Water Resources..... | 3-32 |
| Cultural Resources..... | 3-36 |
| Compliance with the DPG Plan and Other Regulatory Direction | 3-38 |
| Irreversible and Irretrievable | 3-40 |
| References..... | 3-41 |
| Chapter 4 Consultation and Coordination | 4-1 |
| Appendix A – Alternative maps | |

List of Figures and Tables

| | |
|--|------|
| Figure 1-1. Project vicinity map. | 1-3 |
| Figure 1-2. Alternative trail routes considered in detail. | 1-4 |
| Figure 2-1. Key areas within MA 3.51 “Bighorn Sheep Habitat” | 2-6 |
| Figure 2-2. Map of action alternatives: B, E, and H (Proposed Action)..... | 2-11 |
| Table 2-1. Summary of alternative response to Purpose and Need. | 2-15 |
| Table 2-2. Summary of alternative’s response to key issues. | 2-15 |
| Table 3-1. Past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis for the Maah Daah Hey II Trail extension..... | 3-1 |
| Table 3-2. ROS categories and definitions. | 3-4 |
| Table 3-3. ROS areas affected by the action alternatives. | 3-5 |
| Table 3-4. Scenic integrity levels in the Maah Daah Hey Trail II analysis area. | 3-6 |
| Table 3-5. Definitions of wilderness characteristics..... | 3-7 |
| Table 3-6. Direct and indirect effects of the proposed action on roadless characteristics. | 3-9 |
| Table 3-7. Effects of Alternative H on the four aspects of recreation experience..... | 3-11 |
| Table 3-8. Direct and indirect effects of the Alternative B on roadless characteristics..... | 3-14 |
| Table 3-9. Direct and indirect effects from Alternative B on recreation experience..... | 3-14 |
| Table 3-10. Direct and indirect effects of Alternative E on roadless characteristics..... | 3-15 |
| Table 3-11. Direct and indirect effects from Alternative E on recreation experience. | 3-16 |
| Table 3-12. Species dropped from further analysis and rationale for their exclusion. | 3-17 |
| Table 3-13. Species carried forward in the analysis. | 3-19 |
| Table 3-14. Summary of effects to bighorn sheep and raptors by alternative. | 3-24 |
| Table 3-15. Sensitive species occurring in the analysis area for the proposed Maah Daah Hey 2 Trail extension. | 3-25 |
| Table 3-16. DPG Plan direction applicable to soil and water resources..... | 3-32 |
| Table 3-17. Inventoried cultural properties in the Maah Daah Hey Trail II analysis area. | 3-36 |
| Table 3-18. Compliance with DPG Plan direction by alternative. | 3-39 |

Summary

The Medora Ranger District, Dakota Prairie Grasslands, proposes to extend the existing Maah Daah Hey Trail by approximately 45 miles. The new trail extension would begin at Sully Creek State Park and end at the Burning Coal Vein Campground. The proposal includes construction of the proposed Coal Creek campground and five trailheads where the trail would intersect major grasslands roads.

The project has been identified in the quarterly Schedule of Proposed Actions (SOPA) for the Dakota Prairie Grasslands since mid 2003. The legal notice beginning the public scoping process was published on March 27, 2003 giving the public 30 days to comment on the proposed project. As part of the public involvement process, scoping letters were sent out on March 14 to interested parties (permittees, federal, state, county, and local government agencies, tribal agencies, political figures, and other persons who have expressed an interest in natural resource management on the Dakota Prairie Grasslands). Thirty-five comment letters were received in response to the scoping letter.

Using the comments from the public, other agencies, and permittees, the interdisciplinary team developed a list of issues. The issues led the agency to develop alternatives to the proposed action including:

- ◆ Alternative B – one of the two routes originally scoped with the public.
- ◆ Alternative E – proposed by the Sierra Club and Badlands Conservation Alliance.
- ◆ Alternative G – No Action Alternative.
- ◆ **Alternative H – Proposed Action**

Based upon the effects of the alternatives, the responsible official will decide whether to extend the trail and, if the trail is to be extended, the trail location and associated recreation developments accompanying it. If the trail is extended, adaptive management strategies and monitoring will be identified to ensure compliance with desired DPG Plan direction.

CHAPTER 1

PURPOSE OF AND NEED FOR ACTION

The Forest Service (FS) has prepared this Environmental Analysis (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into the following sections. Additional documentation, including more detailed analyses of project-area resources, may be found in the Project Record located at the Medora Ranger District office.

Chapter 1. Purpose and Need for Action: This chapter briefly describes the proposed action, the need for that action, and other purposes to be achieved by the proposal.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the agency's proposed action and alternative methods for achieving the stated purpose. This section also details how the Forest Service informed the public of the proposal and how the public responded. Alternatives were developed based on significant issues raised by the public and other agencies. This chapter also includes design criteria and a summary of the environmental consequences associated with each alternative.

Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the environmental impacts of the proposed action and alternatives.

Chapter 4. List of Preparers and Agencies and Persons Consulted: This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement.

Appendices: The appendices provide more detailed information to support the analyses.

Proposed Action

The Forest Service proposes to construct an extension of the existing MDH National Recreation trail (see Figure 1-1). The proposal includes the construction of 45 miles of trail through the badlands geographic area, one campground, five trailheads, short access trails (less than 100 yards) connecting the trail heads with the proposed MDH II, a half mile of trail connecting the Coal Creek campground to the MDH trail, intervisible wooden trail markers, self-closing gates in fence crossing, bridges and low-water crossings, part of the trail open to mountain bikes (to the new campground), and a half mile (approximately) of access road connecting the campground to Forest Highway (FH) # 3.

The trail extension would start at the Sully Creek State Park, travel in a generally southern direction and terminate at the Burning Coal Vein campground (see Figure 1-2). The trail would be nonmotorized for its entire length. A detail description of the Proposed Action is located in Chapter 2.

Purpose and Need

The Forest Service is currently studying the possibility of extending the Maah Daah Hey Trail from Sully Creek State Park to Burning Coal Vein Campground. “We are studying a potential extension to the trail because we want to offer quality and diverse recreational experiences to the public,” Medora District Ranger Ron Jablonski said. “The Little Missouri National Grassland is so unique, and an extension of a nationally recognized, popular trail will encourage more people to further explore this rugged and beautiful country.”

Compared to more “traditional” (forested) National Forest settings, the badlands and rolling prairie of western North Dakota provide a niche for nature-based dispersed recreation without equal. The Little Missouri National Grassland (LMNG) is the largest parcel of public land in North Dakota. The next closest tracts of National Forest System lands offering developed recreation and trails opportunities are located 350 miles west (Custer National Forest), 250 miles south (Black Hills National Forest), and 300 miles east (Sheyenne Ranger District, Dakota Prairie Grasslands). The LMNG offers a unique setting for the proposed project that could not be accommodated on private land.

The Dakota Prairie Grasslands (DPG) is in the process of developing its recreation and trails program. As such, the DPG trail system is still evolving. The 2003 DPG Recreation and Trails Plan identified the desire to expand the DPG’s nonmotorized trail system. The existing 96-mile Maah Daah Hey (MDH) Trail is a designated National Recreation Trail. The MDH traverses the Little Missouri National Grasslands connecting the northern and southern units of the Theodore Roosevelt National Park. It has made several “Best trail” lists in magazines, on websites, various recreational clubs’ lists and has received international acclaim. The MDH offers recreationists a first-hand chance to experience the natural wonder of the Badlands of North Dakota.

The existing Maah Daah Hey and proposed Maah Daah Hey II trails are envisioned as primary collector trails, from which possible future interpretive opportunities, outfitted adventures, loop trails, or other interests could be developed. The Maah Daah Hey II was identified as a desired project in the DPG Recreation and Trails Plan for the following reasons:

- ◆ The unique recreation niche it would provide, compared to traditional (forested) National Forest System settings.
- ◆ The opportunity to interpret natural and historic resources unique to the badlands and rolling prairie of the northern plains.
- ◆ Visitor demand for more trail opportunities, evidenced by trails being created by trail enthusiasts on the Medora District.

The proposed project fulfills DPG Land Resource Management Plan (2001) goals to provide diverse, high quality outdoor recreation opportunities where compatible with resource objectives. The plan’s Record of Decision (2002) projects increased trail mileage. The proposed project also fulfills direction outlined in the Forest Service Manual (FSM 2330, 2353). National Forests and Grasslands are to maximize opportunities for visitors to experience nature and engage in outdoor recreation. Recreation trails help fulfill this direction.

The analysis team evaluated what would be necessary to accommodate trail and recreation site users while attempting to provide a nonmotorized experience for trail users, a semi-primitive experience for campers, and convenient access for trail users along the trail.

Figure 1-1. Project vicinity map.

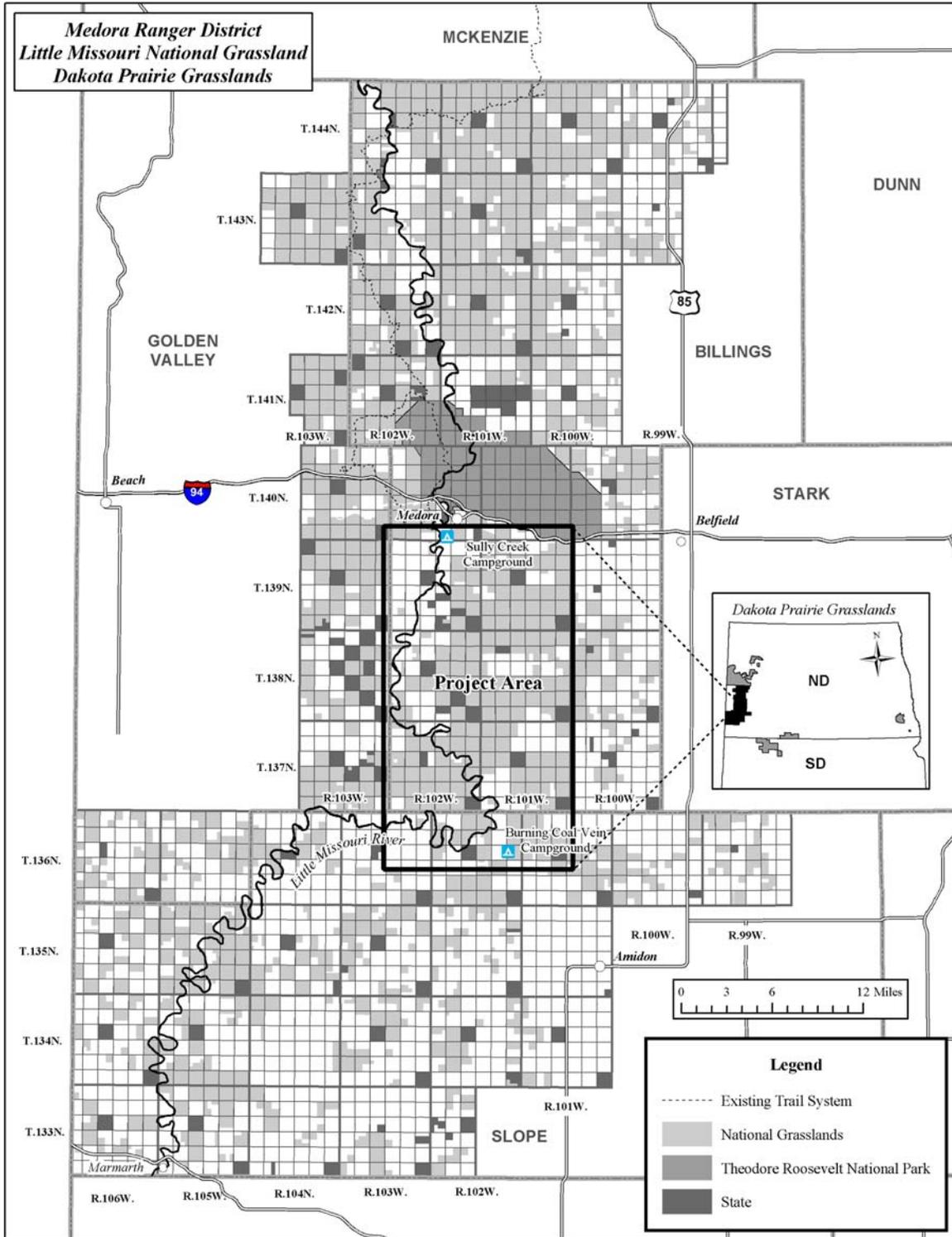
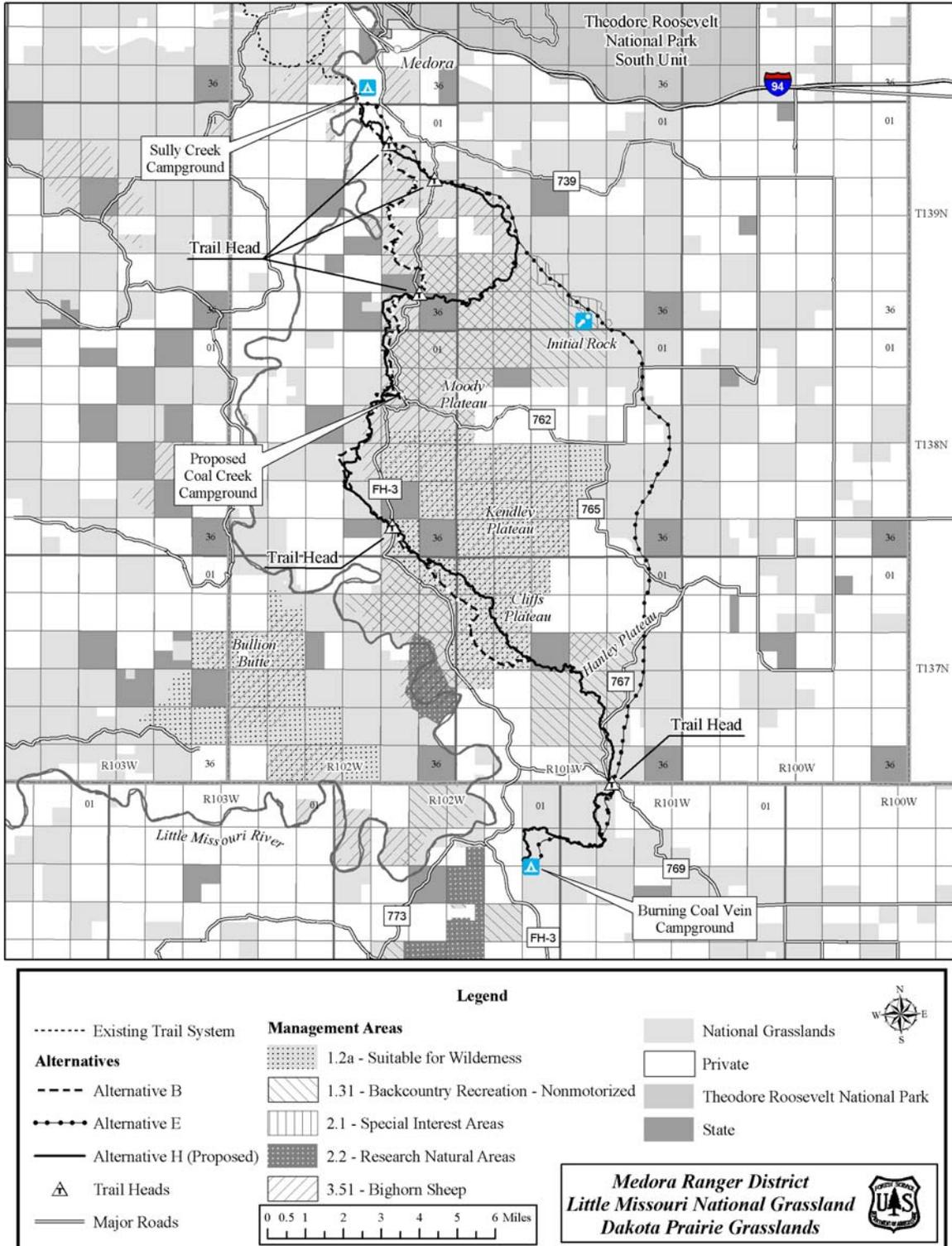


Figure 1-2. Alternative trail routes considered in detail.



The success of the existing MDH, since its construction six years ago, has been remarkable. In that short time, it has been designated a National Recreation Trail. Collection of visitor use data began in 2002, and continues to show growing demand by the public for the types of recreation (i.e. horseback riding, mountain bike use, hiking/backpacking, etc.) associated with the trail. Use of the trail and an increase in recreational visits provide new opportunities within the local economy. An organized trail system is a desirable amenity that can contribute to the economic vitality of surrounding communities. Revenue generated from trail-related recreation and sports activities provide substantial income and employment opportunities (American Hiking Society, 2002). A central theme for the DPG Land Resource Management Plan (DPG Plan) is to contribute to economic diversity of local economies by using grassland resources in sustainable ways (USDA Forest Service 2002). The proposed project embodies that theme.

Project Development

Project commenced April 13, 2001 with meeting between the USFS and NDGF. A follow-up meeting between both parties occurred in April, 2002.

USFS engaged stakeholders September 25, 2002 with in-the-field discussion of this project. In attendance: NDGF, the Wilderness Society, Badlands Conservation Alliance, and ND affiliate of the International Mountain Biking Association (IMBA).

Based on preliminary stakeholder meeting, USFS decided to engage an expanded circle of interests. On September 30, 2002, the Forest Service contacted entities including state agencies, county officials, national and local special interest groups, resource-oriented clubs, grazing associations, the petroleum industry, landowners, and others for general feedback on the project.

An official scoping document went out March 14, 2003. The scoping letter was used by the Forest Service to receive feedback and suggestions about the proposal from the public. These comments were used to help identify significant issues to be carried through the analysis.

A Project Initiation Letter was signed by the Ranger on January 15, 2004, establishing an official ID Team.

Between January and March 2004, the ID Team focused on content analysis of scoping comments, developing project purpose and need, and identifying alternatives. Analysis of public comments from scoping conducted in 2003 resulted in a list of public/agency concerns: user conflicts, economic benefits or lack thereof, increased likelihood of wildfires, increased search and rescue costs, effects on bighorn sheep, spread of noxious weeds, and conflicts with Management Area 1.2a designation. Noxious weeds and bighorn sheep were identified as key issues.

In February, potential conflicts with MA 1.2a prescription replaced noxious weeds as a key issue. The District Ranger decided that weed issues could be mitigated (a change from “significant” to “other” issue), and the issue of MA 1.2a was upgraded to a “significant” issue, following continued interest expressed by Sierra Club and Badlands Conservation Alliance.

The issue of impacts to bighorn sheep has been the most controversial issue and the one that has generated the greatest number of modifications to the trail location. The ID Team engaged in regular dialog with the North Dakota Game and Fish Department (NDGF) to establish design criteria that would help protect bighorn sheep habitat. In addition, the DPG Plan addresses

protection of bighorn sheep habitat in both grasslandwide and management area standards and guidelines:

- ◆ *Standard*: Resolve conflicts in favor of maintaining bighorn sheep habitat.
- ◆ *Guideline*: Prohibit construction of new travel routes across bighorn sheep habitat. (Ch 3, Pgs 23-24).
- ◆ *Standard*: Protect bighorn sheep lambing areas from activities and land use disturbances if adverse impacts to the survival or reproduction success of bighorn sheep or abandonment of the lambing area are likely (Ch 1, Sec F, #12).

Trail location in MA 1.2a is an issue for some individuals/groups because of a perceived conflict with mountain bike use and possible wilderness designation. The District Ranger would allow mountain bike use only from Sully Creek campground to Coal Creek campground. This route avoids MA 1.2a and mitigates the concern about bike use and wilderness designation. For additional discussion on this issue, please see Chapter 2 – Alternatives.

Analysis of public comments from scoping resulted in the development of nine alternatives. Using a list of desired trail characteristics as a ranking tool, this number was reduced to four alternatives which were carried through the remainder of the analysis process.

Project Area Location

The proposed trail would extend from Sully Creek State Park to Burning Coal Vein Campground. The first 1.5 miles of the proposed trail would be located on private property owned by the Theodore Roosevelt Medora Foundation. The remainder of the trail would be constructed on the National Forest System lands of the Medora Ranger District. The trail would start in Billings County and terminate in Slope county (see Figure 1-1).

The proposed Coal Creek campground location is 10 air miles south of Medora, ND, near the intersection of Forest Highway 3 and Road 762 (see Figure 1-2).

Relationship to the DPG Plan

Levels of Decisions

Activities that are planned in the National Forest System involve two different levels of decisions: a general programmatic decision for the entire unit (i.e., DPG Plan) and a site-specific decision for the project area.

This document is not a general management plan for the project area or a programmatic environmental assessment. It is a site-specific linkage between the DPG Land Resource Management Plan (DPG Plan) and its Record of Decision dated July 31, 2002; the Dakota Prairie Grasslands Recreation Strategy and Master Plan dated March 2003; and the requirements established by the National Environmental Policy Act (NEPA).

This decision level involves analyzing a site-specific proposal, as well as disclosing any environmental effects, to achieve the management direction of the DPG Plan. This information will be used by the Responsible Official (Medora District Ranger) to make a reasoned choice for managing the project area.

DPG Plan Direction

The DPG Plan identifies that recreation and trails development are valid uses of the Little Missouri National Grassland (LMNG) as provided for in the following areas of the plan:

Grassland-wide Direction

DPG Plan, Ch 1, p. 4

Goal 2.a: Improve the capability of the Nation's forests and grasslands to provide diverse, high-quality outdoor recreation opportunities.

Goal 2.a - Objective: Provide nonmotorized and motorized trails for a wide variety of uses and experiences.

Managed Recreation Direction

DPG Plan, Ch 1, p. 21

Guideline: Design recreational facilities to blend with the elements found in the natural landscape.

Guideline: Make facilities at trailheads or along trails consistent with the Recreation Opportunity Setting Spectrum and provide for parking, trail information, and appropriate sanitation facilities, as needed.

The proposed project area is subject to Management Area (MA) direction, as described in the DPG Plan:

MA 1.2A – Suitable for Wilderness

DPG Plan, Ch 3, pp. 3-4, 3-5

Desired Conditions: Opportunities for primitive recreation are provided, with a moderate degree of solitude available; There is evidence of past and present human use, such as fences, trails, water developments and primitive roads.

Standard: Allow uses and activities if they do not preclude wilderness designation.

Standard: Limit all motorized use to administrative purposes and that deemed necessary to provide public trailhead facilities on public land within these areas.

Standard: Allow development of necessary trailhead facilities on public land to provide public parking in these areas.

Standard: Allow construction of facilities and structures that are subordinate to the landscape or in keeping with the semi-primitive/primitive character of the area.

MA 1.31 – Nonmotorized Backcountry Recreation

DPG Plan, Ch 3, p. 6-7

Desired Conditions: A variety of un-crowded, nonmotorized, recreation opportunities are provided in a natural or natural-appearing setting; Improvements such as trailheads, trails, signs, bridges, fences, primitive shelters, and water developments may be present.

Guideline: Allow development of necessary trailhead facilities on public land to provide adequate public parking in these areas.

Standard: Allow construction of facilities and structures that are subordinate to the landscape or in keeping with the semi-primitive/primitive character of the area.

MA 3.51 – Bighorn Sheep Habitat

DPG Plan, Ch 3, p. 23-24

Desired Conditions: Other resource management activities are modified as needed to maintain high habitat suitability levels and desired levels of solitude; Coordinate with other federal and state agencies and private landowners to manage habitat and monitor herd size of existing bands of bighorn sheep.

Standard: Resolve conflicts in favor of maintaining bighorn sheep habitat.

This management area underlies portions of MA 1.2a, 1.31, and 2.2, adding a level of complexity to resource management. In particular, the desired conditions for MA 1.31 – Nonmotorized Backcountry Recreation will be subordinate to those for bighorn sheep if there are conflicts. In the case of the proposed trail extension, it required relocating the trail to protect key areas within bighorn sheep habitat.

MA 3.65 – Rangelands with Diverse Natural-Appearing Landscapes

DPG Plan, Ch 3, p. 32-33

Desired Conditions: Natural-appearing landscapes predominate.

Decision to Be Made

An EA is not a decision document. It is a document disclosing the potential environmental impacts of implementing the different alternatives, including the No Action Alternative. After completion of this EA, there will be a 30-day public comment period.

Based on the information in this analysis and a consideration of public comments on the EA, the Deciding Officer will document his decision. If the analysis finds no significant impacts to the human environment, the decisions will be documented in a Decision Notice and Finding of No Significant Impact. If the analysis determines significant impacts may occur, an Environmental Impact Statement will be prepared to further analyze the significant issues.

The District Ranger is the responsible official for this proposal. The decision to be made for this proposal is:

- ◆ To accept or modify the proposed action or select one of the other alternatives.
-

CHAPTER 2

ALTERNATIVES

Introduction

This chapter describes alternatives that wholly or partially meet the purpose and need identified in Chapter 1. Alternatives were designed to address the issues identified from the public involvement process. The action alternatives propose specific activities that would be implemented if selected. Also described are design criteria to reduce impacts to various resources.

Process Used to Formulate Alternatives

Alternatives were developed from key issues identified from public scoping. A Forest Service interdisciplinary team (Team) analyzed comments provided by the public and Forest Service personnel to determine relevant issues associated with the proposed action.

Other alternatives were provided by interested parties during the scoping process. Part or all of these alternatives were adopted and are addressed in this chapter.

The alternatives were fully developed through a series of team meetings, resource inventories, field visits, and public interaction. The responsible official, the District Ranger, reviewed the scoping information and selected the issues and alternatives addressed in the analysis.

Public Involvement

Informal public involvement started with a request from some Slope County residents to consider a possible southern extension of the existing Maah Daah Hey (MDH) Trail.

An initial meeting between the Forest Service (FS) and the North Dakota Game and Fish (NDGF) was held on April 13, 2001 to discuss a proposed southern extension of the MDH.

On September 25, 2002, the FS engaged stakeholders with an in-the-field discussion of the potential trail extension. The NDGF, the Wilderness Society, Badlands Conservation Alliance, and the North Dakota affiliate of the International Mountain Biking Association (IMBA) attended.

Following the preliminary stakeholder meetings, the FS engaged a larger cross-section of potentially interested parties and individuals. In September of 2002, a questionnaire was sent to additional interested individuals, groups, clubs, organizations, adjacent landowners, local grazing associations, the petroleum industry, and state and local governments. The questionnaire described the Forest Service vision of an extension of the MDH trail south of U.S. Interstate Highway 94 (I-94) from the Sully Creek State Park to Burning Coal Campground. Recipients of the questionnaire were asked to comment on the idea and identify possible concerns. Thirty-two

comments were received and evaluated. Responses from the questionnaire are contained in the Project Record.

Additional meetings were held with various people, organizations, and agency representatives to engage further discussion and identify concerns. Meetings with Theodore Roosevelt National Park, North Dakota Game and Fish, Exxon Corporation, and individual respondents led to fine-tuning of the proposal. Individuals who commented on the proposal were mailed an updated letter explaining the project issues. After this process was completed, the District Ranger developed a formal proposed action, which was released for public scoping.

On March 14, 2003, a scoping letter was sent out to 81 individuals, organizations, county and state agencies, county commissioners, and businesses. Notice of public scoping was published in the Dickinson Press on March 27, 2003. The comment period closed on April 18th, 2004. On June 28th, 2004, a news release was prepared by the Medora Range District and sent to area newspapers. The article provided an update on the analysis process to date. Information from the news release was also aired on the NBC six o'clock news on the 28th.

The proposed project was published in the Dakota Prairie Grasslands' National Environmental Policy Act (NEPA) Quarterly Schedule of Proposed Actions in the First and Second Quarters, January-June 2003 issue.

The Medora Ranger District received 35 responses on the proposed project. The comments were analyzed for issues and potential alternatives identified. The comments and analysis are contained in the Project Record.

Determining Issues

An issue is generally a concern the public or the Forest Service may have about a proposal. The Forest Service uses a public involvement process to determine issues the public may have about a proposal and an interdisciplinary team process to determine which issues need to be addressed in the environmental analysis.

Key Issues

Key issues represent concerns from the public or the Forest Service that warrant developing an alternative method of accomplishing the purpose and need other than the proposed action. Each alternative is analyzed to determine how well it addresses the key issue and how well it achieves the purpose and need for this project, and the alternatives are then compared.

Key Issues of the Project

- ◆ The Proposed Action may have an adverse effect on bighorn sheep habitat.
 - ◆ The Proposed Action may have a set of effects that would preclude the Kendley Plateau Inventoried Roadless Area (IRA) from consideration for wilderness designation.
 - ◆ Provide a quality recreational experience.
-

Other Issues

These represent concerns that may be reduced or eliminated through project design. “Design Criteria” for each alternative explain what specific actions would address these “other” issues.

The following “other issues” were identified:

- ◆ Public safety associated with possible trespass onto oil and gas well sites, which may produce hydrogen sulfide (H₂S), a poisonous gas.
- ◆ Wildfire resulting from careless hikers and campers.
- ◆ The spread or introduction of noxious weeds.

Issues Dropped From Analysis

After a review of all the issues, the District Ranger dropped the following from further analysis in this document. Reasoning for dropping the issues is also identified.

- ◆ *Motorized use of the trail:* Some respondents requested that motorized vehicles be allowed to use the proposed trail. The proposal is to extend the existing MDH Trail, which is nonmotorized. Therefore, this request is outside the scope of the Proposed Action.
 - ◆ *How will Forest Service prevent trail users from straying off of the trail?* There is no policy that precludes hikers, horse enthusiasts, or campers from exploring off trail. The Dakota Prairie Grasslands is open to dispersed recreation use.
 - ◆ *Recreation livestock may deplete water sources located along the trail; they may also spread disease and scatter range livestock.* Similar concerns were raised when the original MDH Trail was constructed. To date, there have been no reported cases of range water shortages, cattle disease, or harassment of range livestock associated with hikers, campers, or horse enthusiasts. There is no indication that a southern extension of the MDH would adversely affect the above concerns.
 - ◆ *The FS will not be able to enforce mountain biking restrictions on the proposed trail and this may have an adverse effect on possible future designation of MA 1.2a as wilderness.* If the Proposed Action is selected, the Forest Service would prohibit mountain bike use south of the Coal Creek campground and would be responsible for enforcement of the prohibition. There would probably be violations of the prohibition and the FS cannot guarantee that every infraction would be addressed. However, this is not a condition for Congressional approval of future wilderness designation.
 - ◆ *Possible increase in litter.* The district has a generally observed “pack it in; pack it out” policy, which is posted at trailheads and campgrounds. Some littering on the MDH Trail has occurred; however, it has not been a significant source of concern. While it is likely that some littering would occur on an extension of the MDH Trail, there is no indication it would be a significant problem.
-

- ◆ *Increased cost of Search and Rescue (S&R)* – There was concern that development of the trail would tax existing S&R resources. S&R is the responsibility of the county sheriff offices. The Forest Service assists with any search and rescue activities on National Forest System lands. In addition to county resources, the state of North Dakota has set up a fund to help defray S&R costs. To date, that fund has not been utilized by either county associated with the existing MDH Trail. There have been three reports of lost hikers on the existing MDH Trail; all were located. The FS has participated in all those search and rescue efforts. There is no indication that the Proposed Action would have any significant adverse effect on S&R resources.
- ◆ *The trail extension will not be an economic benefit to area.* Hiking and outdoor recreation is a booming business. The leisure business today is a \$311 billion dollar business. Hiking, backpacking, camping, mountain bike, and horseback riding use show a steady upward trend. Outdoor recreation generates revenue for local communities associated with outdoor recreation opportunities. Direct revenue is generated when recreationist buy gas, groceries, meals, lodging, recreation equipment etc. in these communities. Tax revenue for both state and county governments is also generated. Indirect revenue generated by a nationally recognized trail, such the MDH, can also be substantial as both resident and nonresident recreational users purchase goods and services on their route to the recreation area.

A result of the MDH Trail has been the creation of new outfitting and guiding business, which provide horseback rides, mountain bike excursions, interpretive hikes, lodging, meals etc. for tourists. While there is currently no economic figures for generated revenue tied directly to the MDH Trail, information from the National Forest Visitor Use Monitoring (NVUM) Survey (Stynes and White, 2005) spending profile report indicates local residents spend between \$32.85 to \$116.14 per day, depending on the type of trip. Non-locals spend between \$51.6 and \$245.25. The weighted average is \$105.57 day. The 2003 National Forest Visitor Use Monitoring Results report for the Dakota Prairie Grasslands states that, in a typical year, visitors to the grasslands spent an average of \$1,666.70 on all outdoor activities including equipment, recreation trips, memberships and licenses.

Starting in 2004, trail counters were placed at several locations on the MDH Trail. The information retrieved from the 2005 counters showed increasing trail usage. In 2004, counters indicated 3,017 individuals had used the trail. In 2005, that figure jumped to 5,117. The 2006 recreation season has just started and approximately 2,739 recreationists have used the trail as of June. This influx of recreational use associated with the existing MDH Trail has increased direct revenues to local communities and increased tax revenues for both state and county governments. If we apply the above spending information to the use information, it is apparent that the existing MDH trail generates thousands of dollars annually for the local and non-local economies. Constructing the MDH II Trail extension would provide additional revenue generating and economic diversification opportunities for local communities directly associated the trail.

- ◆ *The proposed trail may breach natural barriers that keep cattle confined to their allotments.* If this should occur, fencing and self-closing gates would be installed to maintain the effect of a natural barrier. The affected permittee(s) would be involved in determining the solution to the problem.
-

-
- ◆ *The Proposed Action may be in violation of the Dakota Prairie Grasslands Land and Resource Management Plan (DPG Plan), specifically MA 3.51 Bighorn Sheep Habitat and MA 3.51A Bighorn Sheep Habitat with Non-Federal Mineral Ownership. The applicable standard and guidelines from these management areas are:*

- ◆ **Standard:** “Resolve conflicts in favor of maintaining bighorn sheep habitat.” (DPG Plan, p. 3-23)

Through a collaborative effort involving NDGF bighorn sheep biologist and the Forest Service district biologist, key bighorn sheep habitat was identified and mapped. The Team used this information to evaluate existing alternatives and to create the Proposed Action (Alternative H) which was further refined through additional conversations with NDGF. All the action alternatives utilize avoidance to protect key sheep habitat (see Figure 2-1). The District Ranger has determined that identifying and avoiding key bighorn sheep habitat fulfills DPG Plan direction to resolve conflicts in favor of bighorn sheep.

- ◆ **Standard:** “Protect bighorn sheep lambing areas from activities and land use disturbances if adverse impacts to the survival or reproduction success of bighorn sheep or abandonment of the lambing area are likely” (DPG Plan, p.1-14)

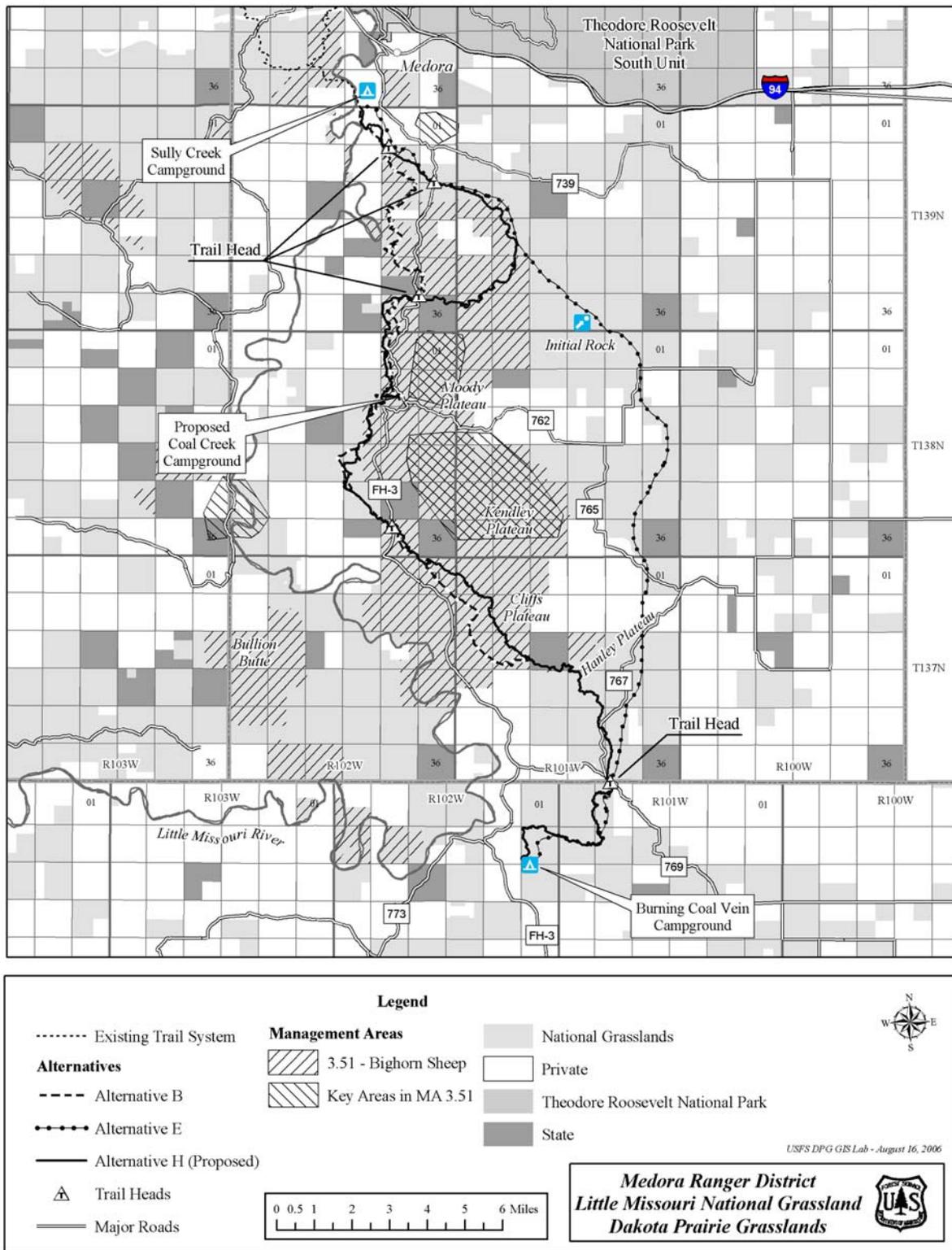
Lambing areas were mapped in cooperation with the NDGF. All the action alternatives were designed to avoid all known lambing areas.

- ◆ **Guideline:** Prohibit construction of new travel routes across bighorn sheep habitat, however, honor valid existing rights such as oil and gas leases” (DPG Plan, p. 3-24).

The DPG Plan Record of Decision defines guidelines as “advisable actions that should be followed to achieve goals and objectives. Guidelines allow for some local line officer discretion given different site-specific conditions and circumstances, but they are also fairly definite expressions of management direction.”

All three action alternatives have a portion of their length in bighorn sheep habitat. However, all the action alternatives have been located to avoid key bighorn sheep areas. While the presence of a trail would violate this guideline, the District Ranger believes bighorn sheep have been protected and recreational and economic opportunities afforded by an extension of the MDH Trail outweigh this guideline in this situation.

Figure 2-1. Key areas within MA 3.51 “Bighorn Sheep Habitat”



Refining the Proposed Action

After a review of the alternatives, the District Ranger selected Alternative H to be carried forward as the Proposed Action. The creation of the final Proposed Action has been a process of continuing refinement. The original proposal for a trail was the result of informal shareholder meetings, discussion, a short questionnaire, and internal FS input. The result of these actions was a formal scoping letter sent to the public. The scoping map identified a mainline trail with two different routes labeled as A and B, which eventually became separate alternatives. Alternative B was created to respond to initial concern about possible impacts to bighorn sheep.

After public scoping was completed and comments were analyzed, concern about effects to bighorn sheep was still evident. To address this, the FS worked closely with the NDGF to identify and map key bighorn sheep areas within MA 3.51 and also outside identified bighorn sheep management areas.

On March 2, 2004, the FS and NDGF biologists met to systematically review Alternative A. Input from the review was documented by the NDGF in a Memorandum dated April 2, 2004. The Team reviewed the information and created a new alternative based on the review. This new alternative, Alternative H, incorporated portions of Alternatives A, B, D, and E and contained most of the NDGF proposed changes. However, Alternative H departs from NDGF recommendations on Cliffs Plateau. The NDGF would like the trail located off of the plateau. The Team reviewed available information and kept the trail on the plateau but moved it from the east side to the far western side of the plateau. This location is outside any identified key bighorn sheep areas. Alternative H was the final alternative created by the Team.

There was also concern that the proposed trail route through MA 1.2a “Suitable for Wilderness” would violate DPG Plan direction and preclude MA 1.2a areas from future consideration for wilderness, if mountain bike use was allowed. The Kendley Plateau IRA contains all the MA 1.2a in the analysis area. The Proposed Action avoids much of MA 1.2a but does traverse through the western portion of the Cliffs Plateau area (see Figure 2-2).

Trails are the primary source of access and conveyance in almost all wilderness within the National Wilderness System. The presence or construction of a trail in an area is not justification for dropping a wilderness candidate from consideration. The Proposed Action (Alternative H) is consistent with DPG Plan direction related to potential wilderness. This topic will be more fully explored in Chapter 3. This analysis will also evaluate Alternative E, which avoids all MA 1.2a areas.

Alternative Descriptions

The alternative descriptions explain the activities that would occur if an alternative were selected. Design Criteria were developed to achieve the intent of the alternative and to minimize or eliminate the identified “other” issues. A detailed description of the environmental effects resulting from the alternatives is given in Chapter 3.

Alternative Evaluation Process

The Team developed the following set of evaluation criteria, which were used to identify which of the nine generated alternatives would be carried through the analysis:

- ◆ Route provides quality recreation experience; i.e., diverse topography, vegetation, and ecology; with maximized scenery and solitude.
- ◆ Route avoids key lambing habitat and loafing or escape terrain of bighorn sheep.
- ◆ Route avoids oil and gas production facilities.
- ◆ Route has minimum instances of road crossing and paralleling, while providing adequate opportunity for visitor access.
- ◆ Route has minimum number of rights-of-way to acquire.
- ◆ Route has minimum number of river crossings.
- ◆ Public safety.

The Team rated each of the nine alternatives using the above evaluation criteria and presented their recommendations to the District Ranger. He decided to carry Alternatives B, E, G, and H through the analysis. The remaining alternatives were dropped from further analysis and are addressed in the *Alternatives Considered but Dropped from Analysis* section of this chapter. The trail evaluations are located in the Project Record.

Alternatives Considered in Detail

Alternative G – No Action Alternative

This is the No Action Alternative required by the National Environmental Policy Act (NEPA) and National Forest Management Act (NFMA). Under this alternative, the status quo would be maintained. There would be no construction of the MDH II extension, Coal Creek Campground, trailheads, or access roads. This alternative provides a benchmark for comparing the action alternatives against the existing conditions.

Alternative B

Concern about possible impacts to bighorn sheep was a central theme around which Alternative B was created. Under this alternative, the trail would be located west of FH3 (East River Road) avoiding Moody and Kendley Plateaus and below Cliffs Plateau (see Figure 2-1) to mitigate possible effects on bighorn sheep in these areas. Alternative B was one of the original alternatives scoped with the public. It was created by the FS based on information gathered through informal shareholder meetings and conversations and questionnaire input. Under Alternative B mountain bikes would have access to the entire length of the trail.

The actions items under Alternative B are identical to those that would occur under Alternative H with two exceptions. Under Alternative B, one less foot bridge and one less trailhead would be constructed. This alternative would likely be constructed in a phase approach similar to Alternative H.

Alternative E

This alternative was submitted by the Sierra Club, Badlands Conservation Alliance, and IMBA as a potential trail route. Under this alternative, the trail sweeps east from Medora out into the rolling prairie, then southeast through the Davis Creek area, then south, terminating at the Burning Coal Vein Campground (see Figure 2-2).

This route was presented as an alternative to their concerns about trail construction and mountain bike use in MA 1.2a (Kendley Plateau IRA) precluding wilderness designation and potential impacts on bighorn sheep. It addresses their preference to have a trail located outside MA 1.2a "Suitable for Wilderness" and MA 3.51 "Bighorn Sheep Habitat." Under this alternative, mountain bikers would be able to access the entire length of the trail.

Action items (e.g., trail width, signing, etc.) implemented by Alternative E would be identical to that of Alternative H. There would be four trailheads and no new campground would be built. This alternative would likely be constructed in a phase approach similar in timing to that of Alternative H.

Alternative H – Proposed Action

This alternative was designed to address the key issues related to continuing concerns about bighorn sheep and concerns about mountain bike use in the Kendley IRA. This alternative was also responsive to the purpose and need of this project.

The FS wildlife biologist worked closely with the NDGF bighorn sheep biologist to identify and map key areas such as lambing areas. This information, in combination with telemetry and historical use data, was utilized to create Alternative H. This was the last alternative created; it is a combination of Alternatives A, B, D, and E.

Alternative H (see Figure 2-2) allows mountain bike access from Sully Creek to the proposed Coal Creek campground. From Coal Creek to the Burning Coal Vein campground, the trail would be open to foot and horse traffic only. This addresses concerns about the use of mountain bikes in the Kendley Plateau IRA and potential adverse ramifications related to potential wilderness designation.

If the proposed action is selected, trail construction activities would occur in three phases over the next three years. Each phase would construct about a third of the trail. Trail construction would start at the Burning Coal Campground in 2007 and proceed north. The Coal Creek Campground access trail and road would be the last facility to be constructed in year 2009.

This proposal includes the following actions:

- ◆ The width of the trail tread will vary from 12 to 36 inches, depending on the type of terrain being crossed and if switchbacks need to be excavated. Average trail width is 18 inches.
 - ◆ The trail tread will generally be native surfacing, except in clay areas and highly erodible soils where it will have an aggregate surface. The short (i.e., less than 100 yards) access trails from the trailheads to the main trail may also be surfaced with aggregate. In areas with side slopes of less than 25 percent, the trail will be a mowed, three-foot-wide path.
 - ◆ The grade of the trails will range from 0-10 percent, with short pitches of up to 15 percent.
 - ◆ Water bars, culverts, and low water crossings will be placed as needed. There will be eight intermediate stream crossings, three low water crossings, and five small foot/horse bridges.
-

- ◆ Constructed switchbacks, as needed.
- ◆ Where the trail breeches a natural boundary, fencing will be constructed and self-closing gates installed.
- ◆ Self-closing gates will be constructed at all fence crossings. The gates are spring-loaded and constructed of metal tubing and wire which can be opened from horseback or on foot.
- ◆ Reassurance markers will be placed intervisibly along trail for navigation. The markers are 4x6 inch treated wooden posts branded with a turtle image, which is symbol of the MDH.
- ◆ Miscellaneous signs as necessary to mark geographic features, directions at trail junctions, road crossings, and property boundaries.
- ◆ The trail will be located on National Forest System lands and away from roads, oil wells, and other facilities and infrastructure when practical.
- ◆ The Forest Service will acquire rights-of-way for those sections of the trail crossing state or private land.

The proposed Coal Creek campground would be approximately five acres in size and would have the following amenities:

- ◆ 10 to 15 camping spurs with picnic tables and fire rings. Approximately half the campsites would be designed for horse users.
- ◆ Potable water source.
- ◆ Universally accessible vault toilet.
- ◆ Information kiosks.
- ◆ Campfire rings and picnic tables.
- ◆ Shade shelters if needed.
- ◆ Hitching stalls or rails.
- ◆ Buck and pole and smooth-wire fencing around the campground
- ◆ Cattle guard at the entrance.
- ◆ Self-closing gate for trail access.
- ◆ An engineered, surfaced, half mile loop road within the campground.
- ◆ A quarter to half mile spur trail to access the MDH 2 extension.

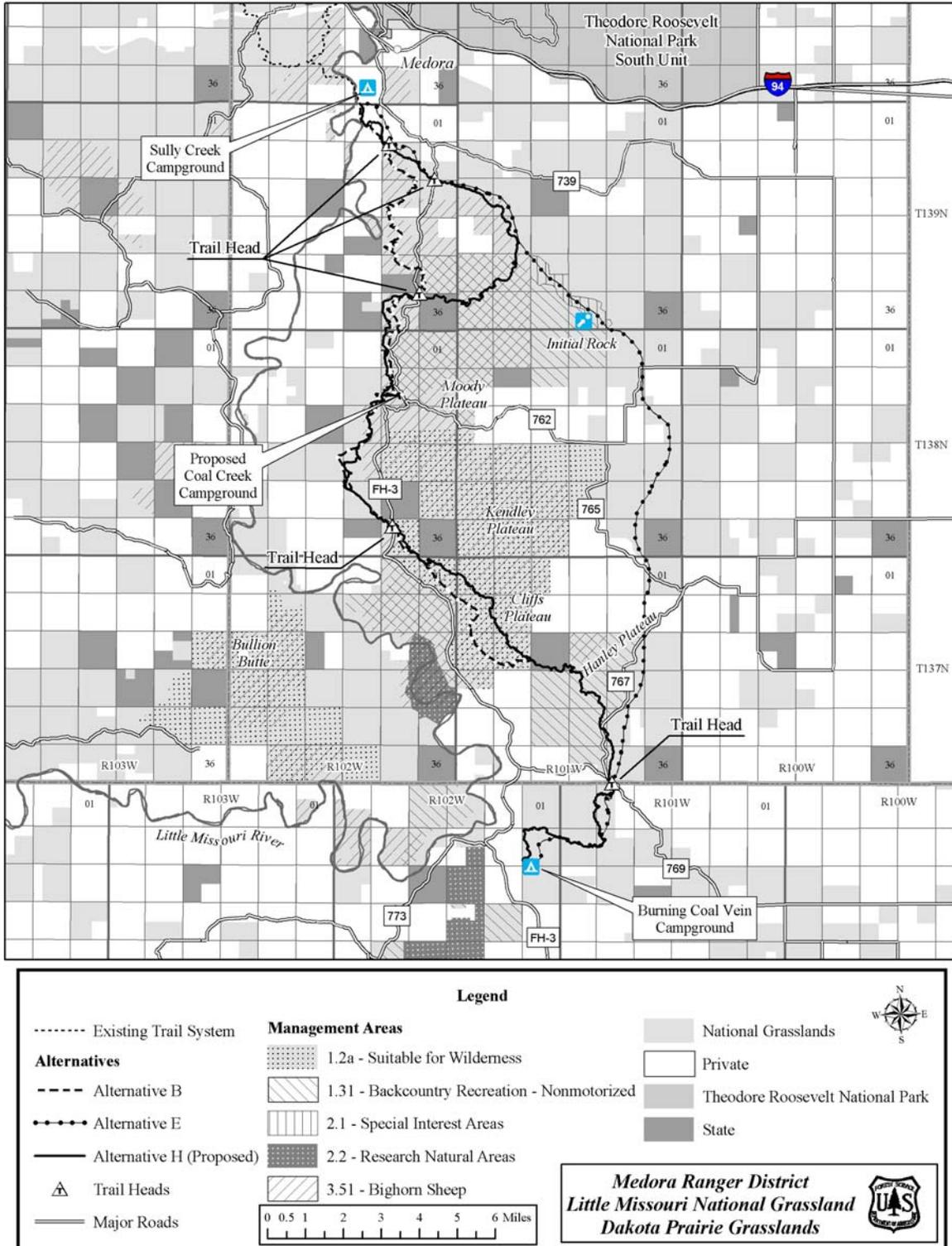
The five proposed trailheads would have the following features:

- ◆ Information kiosks.
- ◆ Parking to accommodate three to five vehicles, including RVs and horse trailers.
- ◆ Hitching rails for trail stock.
- ◆ Cattleguards, if necessary.

Access Road.

- ◆ The quarter mile access road connecting the campground to FH3 would be an engineered road with a design speed of 15 mph. The road would have a 12-foot running surface, with ditches, culverts, and gravel-aggregate surface material.
-

Figure 2-2. Map of action alternatives: B, E, and H (Proposed Action).



Design Criteria

The following design criteria are common to all three action alternatives.

Public Safety: There is a concern with possible exposure to hydrogen sulfide (H₂S) gas from producing oil and gas wells.

- ◆ H₂S is not normally a concern for oil wells located south of I-94. All existing wells within quarter mile of the proposed trail route are located in the Medora or Fryberg oil and gas fields. According to the Bureau of Land Management (BLM), these fields are not big gas producers, and if all the gas in the Fryberg field were to escape at one time, in one place, the danger zone would be a 92-foot radius from the wellhead. Under most circumstances, the danger zone would be limited to the well pad. If recreationists avoid well pads, the safety concern is minimal. The proposed trail has been located to maximize the distance between the trail and existing oil and gas well pads are posted with warning signs if H₂s is present.
- ◆ All new Little Missouri National Grasslands published recreation brochures would include hydrogen sulfide (H₂S) safety guidelines. Additionally, H₂S safety guidelines will be outlined on Dakota Prairie Grasslands website: <http://www.fs.fed.us/r1/dakotaprairie>
- ◆ Bulletin boards would be installed at the campgrounds and trailheads. These “information centers” would feature posted articles, tips, regulations, and other points of interest. Information items include prevention of wildfires, minimum impact camping, H₂S safety guidelines, avoiding livestock disturbance, preventing vandalism, courtesy to adjacent landowners, and Pack It In/Pack It Out garbage removal policy.

Noxious Weeds

- ◆ The use of weed-free hay on National Forest System lands is an established policy on the DPG. Feeding this hay should be encouraged two to three days prior to arrival or use of the trail.
 - ◆ Horse manure at campgrounds should be collected and stored in specific locations where it can be monitored and treated for weed species.
 - ◆ Bridges will be constructed over narrow deep channels such as Toms Wash and Merrifield Creek is encouraged. Several highly incised drainage crossings are likely to result in difficulties of trail construction and maintenance, additional erosion immediately adjacent to the channel, and increased opportunities of assisting the spread of weed populations, especially with regard to sticky clay substrates that would facilitate seed adhering to travelers and equipment.
 - ◆ Utilize strategies in the USDA Forest Service National Strategy and Implementation Plan for Invasive Species Management (2004), and the Guide to Noxious Weed Prevention Practices (2001), to control invasive species. Treatments, following the guidance provided in the DPG Noxious Weed FEIS and ROD (anticipated in September, 2006), would be initiated prior to trail construction to lessen the potential for this activity to disperse propagules along the freshly disturbed route. Monitoring and treatment should then be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness. More site-specific control measures are described in *Biological Evaluation*
-

and Impact Assessment for Botanical Resources in Regards to the Proposed Maah Daah Hey II Trail, on file in the project record.

Wildfire: There is always a possibility of wildfire either natural or person-caused. To date, there have been no fires caused by recreationist using the MDH trail. There is no way to guarantee that a fire will not occur from trail users as is the case with any use of the National Grasslands. However, the following actions will be taken to minimize the chance of a person-caused fire.

- ◆ District personnel perform fire patrols when fire restrictions are issued and/or conditions warrant.
- ◆ The use of fire may be prohibited or the trail may be temporarily closed to recreationist if climatic conditions create extreme fire conditions.
- ◆ Fire restrictions would be posted at all campgrounds and trailheads.

Trail Maintenance

- ◆ After construction is completed, trail maintenance on that portion of the trail located in the Kendley IRA (MA 1.2a) will be conducted by non-motorized means. Motorized means may be considered for trail maintenance if the trail is damaged and poses a significant public safety risk, which cannot be addressed in a timely manner by nonmotorized means.

Alternatives Considered but Dropped From Analysis

The Team evaluated all nine alternatives and provided the District Ranger with recommendations for each alternative. He then determined which alternatives would be dropped from detailed analysis. His reasons are stated below:

- ◆ **Alternative A** was the original proposed action created by the Team (see Figure A-1 in Appendix A). This alternative ranked high on most of the trail criteria. However, it would have been constructed in key lambing and summer areas within MA 3.51 Bighorn Sheep Habitat. To avoid impacts to bighorn sheep in these key areas, the Team recommended dropping this alternative.
- ◆ **Alternative C** was also created by the Forest Service. It would have totally bypassed MA 1.2A Suitable for Wilderness and MA 3.51 Bighorn Sheep Habitat (see Figure A-2 in Appendix A) and therefore would have met identified concerns about building a trail through these management areas. The Team recommended dropping this alternative because implementation would have required the following:
 - ❖ The trail construction through the Ponderosa Pines Research Natural Area (RNA). Under FSM 4063.3 Protection and Management Standards [for RNAs] the construction of roads, trails, fences, or signs on an established RNA is prohibited unless they contribute to the objects or protection of the area. The proposed trail did not meet this criterion.
 - ❖ Crossing key bighorn habitat located outside MA 3.51 and 3.51A.

- ❖ Crossing the Little Missouri River twice. Since low water crossing would have been planned, this would probably have limited trail use during the spring of the year or at other times when intense summer thunderstorms can suddenly swell the river. There were also potential safety concerns related to recreationists being stranded or trying to ford the river during high water.
- ◆ **Alternative D** was created based on concerns the NDGF expressed in their April 22, 2003 scoping response. The NDGF was concerned about lambing and escape cover on the north end of the trail and suggested the trail be moved into Sections 13 and 24, T139N, R102W and that the trail "... not impede the Moody/Kendley/Cliffs Plateau areas as would be done under Extension A". Alternative D was created to address these concerns (see Figure A-3, Appendix A).

The Team recommended this alternative be dropped because of the rather extensive amount of the trail that would parallel Forest Highway 3, which would result in a low quality recreational experience.

- ◆ **Alternative F** was developed by the Badlands Conservation Alliance and submitted to the Forest Service in their April 17, 2003 scoping response. This alternative is identical to Alternative D with the exception that a mountain bike route was added to the design. The loop would parallel FH 3 to the junction of NFSR # 769 it would then parallel NFSR #769 to the junction of roads #769 and #767 where it would turn south traveling cross-country to Burning Coal Vein campground (see Figure A-4, Appendix A).

The Team recommended this alternative be dropped for the same reasons as Alternative D. In addition, acquiring the necessary rights-of-way, for the mountain bike route along FH 3, was determined to be to time consuming and expensive. Obtaining permanent rights-of-way across all the private land is also unlikely.

- ◆ **Alternative I** was developed by the Wilderness Society and submitted in their April 2, 2003 scoping response (see Figure A-5, Appendix A). This route would utilize part of Alternative B down to Bear Creek in Section 35, T138N. From there, the proposal would parallel FH 3 south to the junction of FH3 and National Forest System Road (NFSR) #772. It would then run parallel to NFSR #772 into Burning Coal Vein Campground. The proposal also identified that the trail would be constructed within 100 yards of the roads. This proposal also included the possibility of creating a loop trail at the south end of the trail. The loop would consist of a portion of FH3, NFSR 769, 780 and the very southern part of Alternative B.

The Team recommended this alternative be dropped due to extensive road paralleling which provided for a poor quality recreational experience as defined by a diverse topography, vegetation, and ecology, with maximized scenery and solitude. There was also concern with safety issues that might arise with the trail located so close to the busy East River Road and the effect of considerable dust from the road's scoria surface.

Comparison of Alternatives

The following tables briefly display the differences between the considered alternatives. The comparison shows the extent of each alternative meeting the Purpose and Need, as well as how each alternative addressed the key issues.

Table 2-1. Summary of alternative response to Purpose and Need.

| Purpose and Need Objective | Least Response ← Relative Response → Better Response to Purpose and Need | | |
|---|---|---|---------|
| Develop recreation and trails program as per DPG Recreation Strategy and Master Plan | G | | B, H, E |
| DPG Plan direction to provide for nonmotorized and motorized trails with a wide variety of uses and experiences (Goal 2.a (6)) | G | B | E, H |
| Provide trail-related recreation opportunities that emphasize natural setting, serve public needs, and meet land management and recreation policy objectives. FSM 2353.02 | G | | B, H, E |
| Contribute to the economic diversity of the area | G | | B, H, E |

Table 2-2. Summary of alternative's response to key issues.

| Key Issue and Measure | Less Impact ← Relative Impact → Greater Impact to Key Issues | |
|--------------------------------|---|---|
| Suitable for Wilderness | | |
| Roadless Characteristics | <p>Alternative E would not be located in MA 1.2A; therefore, it would not have any effects on roadless characteristics.</p> <p>Under Alternative G, no trail would be built in an IRA so there would be no impacts to roadless characteristics.</p> | <p>Alternatives B and H travel about the same distance in MA1.2a. Their presence would have an effect on solitude and serenity, challenge. Effects to recreational opportunity could be seen as positive or negative depending on one's point of view.</p> |

| Key Issue and Measure | Less Impact ← Relative Impact → Greater Impact to Key Issues | | | |
|---|--|---|---|--|
| Bighorn sheep | | | | |
| Avoidance of known key areas for bighorn sheep. | Under Alternative G , there is no trail construction in sheep habitat so there would be no impact to bighorn sheep. | Alternative E avoids all known key bighorn sheep areas. Approximately 1.1 miles of trail are located in bighorn sheep habitat. | Alternative B avoids all known key bighorn sheep areas. Approximately 21.1 miles of trail are located in bighorn sheep habitat. There would be fewer impacts to sheep because the trail would be located below Cliffs Plateau. | Alternative H avoids all known key bighorn sheep areas. Approximately 20.6 miles of trail are located in bighorn sheep habitat. |
| Key Issue and Measure | Low ← Relative → High | | | |
| Recreation experience | | | | |
| Diverse landscapes, scenery, opportunities for solitude | There is no trail under Alternative G so this key issue is not applicable. | Alternative B shares many of the attributes of Alternative H; however, by locating the trail below Cliffs Plateau, a major scenic opportunity is foregone. This alternative provides more opportunities for solitude than Alternative G but less than Alternative H. | Under Alternative H , the trail traverses badlands geographic area. It provides the best opportunities for viewing high elevation panoramic vistas and has more vistas than other alternatives. Scenery is continually changing due to elevation changes and rugged badlands topography. Provides greatest amount of opportunities for solitude. | Under Alternative E , the trail traverses badlands and rolling prairie geographic areas. There is a variety of scenery but relatively long stretches of unchanging scenery. This alternative offers fewer scenic vistas. Potential for solitude is highest in badlands and moderate on rolling prairie. |

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

Chapter 3 summarizes the physical and biological environments of the project area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the alternatives chapter.

The effects analysis considers direct, indirect, and cumulative effects to the resources in the project. **Direct environmental effects** are those that occur at the same time and place as the initial action. An example would be on-site soil compaction from rubber-tired skidders harvesting timber. **Indirect environmental effects** are caused by the action, but occur later in time or are spatially removed from the action. An example would be downwind effects of a power plant on air quality.

Cumulative effects are a combination of direct and indirect effects of an alternative combined with the effects of past, present, and foreseeable future activities undertaken by either the Forest Service or other parties. In each resource section in this chapter, the cumulative effects discussion defines the cumulative effects analysis area for the resource and how each cumulative effects analysis is bounded in time. Unless a different time period is defined, reasonably foreseeable future actions are considered for the expected life of the project. The following table lists the past, present, and reasonably foreseeable actions considered in the cumulative effects analysis. All actions do not apply to each resource. Only those actions with relevant impacts to a specific resource were analyzed and discussed in the following resource sections.

Table 3-1. Past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis for the Maah Daah Hey II Trail extension.

| Project/Activity | Location | Effects |
|------------------------------------|--|---|
| Past and Concurrent Actions | | |
| Farming | In the Rolling Prairie section of the project area | Landscape modification. Introduction of invasive species when farmed areas were reclaimed. |
| Livestock grazing | Throughout the project area. | Fences, water developments, and other range facilities were constructed and two-track roads were created. Change of Recreation Opportunity Spectrum (ROS) character from primitive to semi-primitive for the most remote sites in the analysis area. Grazing permittees are allowed cross-country access for administration of their grazing allotments which may affect recreational experiences for some recreationists. |

| Project/Activity | Location | Effects |
|---------------------------------------|--|--|
| Oil and gas development | Northern half of project area | Construction of roads, well pads, pipelines, and production facilities. Road development has likely moved some semi-primitive areas into roaded natural and roaded modified ROS categories. Lease holders may travel cross-country for oil and gas location development and maintenance activities. Same effect on recreation as that noted under livestock grazing. |
| Developed recreation | Burning Coal Vein Campground | Provided first developed recreation facilities in southern half of the Medora Ranger District. Increased recreation use of the area surrounding the campground, particularly the Ponderosa Pines area. |
| Dispersed recreation | Throughout the project area | Dispersed recreation use has occurred for decades and continues today. Opportunities include camping, hiking, hunting, driving for pleasure, bird watching, etc. These opportunities are beneficial to who utilize them. |
| Road development | Entire project area. Greatest density in the northern portion. | Opened up country that was historically accessible only by horseback or seasonal two-track road system. Increased dispersed recreation opportunities such as hunting, driving for pleasure, camping, hiking, etc. |
| Reasonably Foreseeable Actions | | |
| Oil and gas development | Northern half of project area | May cause additional changes in the ROS setting. Could preclude wilderness designation in Tracy Mountain and Easy Hill Inventoried Roadless Areas (IRAs). |
| Livestock grazing | Entire project area | Can be a negative or positive effect. Some recreationists dislike seeing, hearing or smelling livestock. They feel it has an adverse effect on their recreational outing. Others enjoy seeing livestock and experiencing part of the “Old West.” Range developments are visible. |

Recreation

One of the focal points of the Dakota Prairie Grasslands (DPG) is its developing recreation program. Building upon traditional recreation uses of hunting, sightseeing, driving for pleasure, hiking, horseback riding, and bird and wildlife watching, the DPG is an emerging recreation destination for North and South Dakota. In addition to traditional recreation uses, the DPG is also becoming a destination point for non-traditional uses such as mountain biking. One of the focuses of the recreation program is to increase the amount of developed recreation and trails

available to the public. Over the last several years, the DPG has constructed or renovated campgrounds and trailheads across the unit.

Currently, the Maah Daah Hey (MDH) trail is the spine of the Little Missouri National Grassland fledgling trail system. It is a nonmotorized, 96-mile trail which travels through National Forest System, state, and private lands and connects the northern and southern units of Theodore Roosevelt National Park. The proposed 45-mile extension of the MDH trail is a continuation of the DPG's commitment to develop trail opportunities for the public.

Regulatory Framework

The following provides the regulatory framework under which this project was proposed. A detailed (expanded) description of this information is contained in the Recreation specialist report on file in the Project Record.

- ◆ 2001 Dakota Prairie Grasslands (DPG) Land and Resource Management Plan and Record of Decision (2002).
- ◆ Forest Service manuals 2302 and 2353.02.
- ◆ DPG Recreation Strategy and Master Plan.
- ◆ National Recreation Agenda.

Methodology for Analysis

The analysis focuses on two recreation-related key issues identified through the scoping process. The first issue deals with how the trail alternatives will affect Inventoried Roadless Areas (IRAs) and if the effects would preclude consideration for wilderness designation. To address this, each of the three action alternatives will be evaluated in terms of their effects on applicable roadless characteristics. If effects to roadless characteristics are severe enough, they can preclude an area from possible wilderness designation.

The second key issue revolves around the ability of the trail to provide a high quality recreation experience. While this is somewhat of a subjective issue, it is evaluated in terms of the diversity of landscapes visited, type of scenery and panoramic views available, different types of vegetation a user would see, and the opportunities for solitude along trail.

The analysis area includes all three of the action alternatives carried through the EA. It covers an area from Sully Creek Campground on the north to Burning Coal Vein Campground on the south. It encompasses portions or all of the National Forest System (NFS) lands located in T136N, R101, 102, and 103; T137N, R 101 and 102W; T 138N R101 and 102W, T139N R101 and 102W (see Figure 1-1 in Chapter 1).

Existing Condition

Current recreation use in the analysis area includes hiking, horseback riding, developed and dispersed camping, bird and wildlife watching and big game and upland game hunting. The rugged badland terrain and drainages provide numerous opportunities for solitude. The rolling prairie portions of the analysis area provide moderate potential for solitude; adjacent developments including oil wells, roads, and ranches, are visible.

The Burning Coal Vein Campground is the only developed recreation facility in the analysis area. It receives use throughout the summer, with the heaviest use occurring during fall big game hunting season. Within the analysis area, the public has the right to pursue dispersed nonmotorized, cross-country recreation opportunities across the entire area. Motorized recreation is allowed on existing roads and trails throughout the analysis area except for those management areas which prohibit motorized use such as MA 1.2A Suitable for Wilderness and MA 1.31. Nonmotorized Backcountry Recreation. Cross-country motorized use by the general public is prohibited.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a system for planning and managing recreational resources that categorizes recreational opportunities into eight classes. Each class is defined in terms of the degree to which it satisfies certain recreational experience needs based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use.

The ROS spectrum ranges from Primitive to Urban. Within the analysis area there are four ROS designations; semi-primitive nonmotorized; semi-primitive motorized; Roaded Natural; and Roaded Modified. Table 4 provides the definitions for the applicable ROS categories.

Table 3-2. ROS categories and definitions.

| ROS | Definition |
|--------------------------------|--|
| Semi-primitive Nonmotorized | The area is characterized by a predominately natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized recreation is not permitted, but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impact on recreational opportunities. |
| Semi-primitive Motorized | The area is characterized by a predominately natural or natural appearing environment of moderate to large size. The concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized use of local primitive or collector roads with predominately natural surfaces and trails suitable for motor bikes is permitted. |
| Roaded Natural | The area is characterized by predominately natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence is usually harmonious with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident but compatible with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities. |
| Roaded Modified | An area characterized by a natural environment that has been substantially modified by structure and vegetative manipulation. No on-site facilities are present except signing at major road junctions. Moderate evidence of other users on roads is present. Minimal site controls of users are present, except for gated roads. |

The following table identifies the different ROS areas through which the action alternatives would pass.

Table 3-3. ROS areas affected by the action alternatives.

| Alternative | ROS Category |
|--------------------|---|
| B | The first four miles or so of this route would lie in Roaded Modified. From there to about a mile north of Bear Creek, the trail would be in Roaded Natural. From the Bear Creek area, the trail would travel southeast through Cliffs and Hanley Plateaus where the ROS would be in Semi-Primitive Nonmotorized. Upon exiting Hanley Plateau, the remainder of the trail would be in a Roaded Natural setting |
| E | The first two miles of the trail would be in Roaded Modified. The next seven miles would be in Roaded Natural. The next four miles would be in Semi-Primitive Motorized; the remainder of the trail would be in Roaded Natural. |
| H | The first two miles would be in Roaded Modified, followed by about three miles in roaded natural and then roughly two miles in Semi-Primitive Nonmotorized. At this point, the trail would cross FH 3. From there to about a mile north of Bear Creek, the ROS would be Roaded Natural. From the Bear Creek area, the trail would travel southeast through Cliffs and Hanley Plateaus where the ROS is Semi-Primitive Nonmotorized. Upon exiting Hanley Plateau, the remainder of the trail would be in a Roaded Natural setting. |

The primary effects associated with the action alternatives would be the construction of the trail tread, trailheads, Coal Creek Campground, and an increase in the number of people utilizing a given ROS area. None of these actions, separately or in combination, would cause a significant enough effect to modify any ROS categories through which the trails pass.

Inventoried Roadless Areas (IRAs) / Special Interest Areas (SIAs)

There are three Inventoried Roadless Areas (Tracy Mountain, Easy Hill, and Kendley Plateau) and one Special Interest Area (Custer Trail/Davis Creek) in the analysis area (see Figure A-6 in Appendix A). All these areas are open to motorized use by grazing permittees for administration of their grazing allotments. Parts of the Tracy Mountain IRA, Easy Hill IRA, and Custer Trail/Davis Creek SIA are leased for oil and gas development. The southeast portion of the Tracy Mountain IRA contains active oil and gas wells.

The DPG Plan Record of Decision identified four IRAs allocated to MA 1.2A Suitable for Wilderness. In the analysis area, the Kendley Plateau IRA is the only one allocated to Management Area 1.2A. The other IRAs, Tracy Mountain and Easy Hill, have been allocated to other MAs and uses. The Custer Trail/Davis Creek Special Interest Area (SIA) recognizes the historic significance of General Alfred Terry and Lt. Colonel George Custer's 1876 expedition across the badlands to the Battle of the Little Bighorn. Management emphasis for the SIA is on education, interpretation, research, and the protection of the wildlife and botanical resources, heritage sites, historic landscape, and historic setting.

Scenic Integrity Level

Scenic Integrity Level (SIL) is a method for identifying the state of naturalness or, conversely, the state of disturbance, created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character in a National Grassland or Forest. SILs

range from Very High to Unacceptably Low. Within the analysis area, there are three SILs: high, medium, and low. All of the alternatives would meet their respective SILs.

Table 3-4. Scenic integrity levels in the Maah Daah Hey Trail II analysis area.

| SIL Category | Definition |
|-----------------------------|---|
| High (Appears Unaltered) | This level refers to landscapes where the valued landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture and pattern common to the landscape character so completely and at such scale that they are not evident. |
| Moderate (Slightly Altered) | This level refers to landscapes where the valued landscape character appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed. |
| Low (Moderately Altered) | This level refers to landscapes where the valued landscape character appears moderately altered. Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within. |

Desired Condition

The general desired condition for the recreation in the analysis area is to maintain existing recreation developments and develop new ones as the demand for recreation increases. Recreation experiences would focus on open and undeveloped landscapes. (DPG Plan, Ch 2. pp. 2-10, 2-18)

The desired condition for the trails portion of the recreation program is to provide high quality opportunities that will continue to meet anticipated demand for a variety of trail experiences. Visitors demand for different trail experiences will be balanced against a need for sustainable development and management. The DPG Recreation Strategy identifies the following goals for the trail program:

- ◆ Immediately respond to safety issues.
- ◆ Meet customer needs for information, education, and resource protection.
- ◆ Have well-maintained trails located only in areas where trails are appropriate.
- ◆ Design trails that protect the resource and are affordable under anticipated budgets.
- ◆ One of the visions for the Little Missouri National Grassland, as identified in the Recreation Strategy is to “Focus on the MDH trail as the “Jewel of the Badlands” (Rec. Strategy, pp. 29, 34).

Environmental Consequences

This section identifies the potential environmental consequences under the three action alternatives. The discussion has been narrowed to address the two issues that have been raised in relation to recreation:

- ◆ The effect of an alternative on an IRA's ability to be recommended for addition to the National Wilderness Preservation System. This concern is related to effects on MA1.2a Suitable for Wilderness which in the context of this analysis is the Kendley Plateau IRA. However, the analysis will look at effects to all the IRAs impacted by the different alternatives.
- ◆ An alternative's ability to provide a quality recreational experience.

The second key issue revolves around the ability of the trail to provide a high quality recreation experience. While this is somewhat of a subjective issue it is evaluated in terms of the diversity of landscapes visited, type of scenery and panorama views available, different types of vegetation a user would visit and the opportunities for solitude along trail.

To determine if an area qualifies for inclusion in the National Wilderness Preservation System, it must meet the test for capability, availability, and need as directed by FSH 1909.12. Capability is the degree to which an area contains the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness. It is evaluated in terms wilderness characteristics.

The Northern Great Plains FEIS utilized the following characteristics in its analysis of the IRAs on the Dakota Prairie Grassland: Solitude and Serenity, Natural Appearance and Integrity, Challenge, Recreational Opportunity, Unique Characteristics, Outdoor Education, Size and Shape, and Manageable Boundaries (see the following table). Size and Shape and Manageable Boundaries characteristics will not be used as none of the alternatives would have any effect on these characteristics. The effects of an alternative on these different wilderness characteristics will be used to determine if an alternative would preclude an IRA from consideration as a potential wilderness candidate.

Table 3-5. Definitions of wilderness characteristics.

| Wilderness Characteristic | Definition |
|----------------------------------|---|
| Solitude and Serenity | Solitude is a personal, subjective value defined as isolation from the sights, sound and presence of others, and human developments. Solitude can be impacted by numbers of people and parties encountered on a trail or in a camping area, human-generated noise, or improved access. Serenity is also a personal, subjective value influenced by the solitude offered by an area. Physical factors that can affect solitude and serenity include topography, vegetative screening, distance from human impacts, such as roads and oil and gas operations, and changes in legal public access. |
| Natural Appearance and Integrity | Natural appearance means that the environment looks natural to most people using the area. Even though some of the long-term ecological processes of an area may have been interrupted, the landscape of the area generally appears to be affected by the forces of nature. If the landscape has been modified by human activity, the evidence is not obvious to the casual observer, or it is disappearing due to natural processes. |

| Wilderness Characteristic | Definition |
|---|--|
| Natural Appearance and Integrity, cont. | Natural integrity is the extent to which long-term ecological processes are intact and operating. Impacts to natural integrity are measured by the presence and magnitude of human-induced change to an area. Such impacts include physical developments (e.g., roads, fences, cabins), recreation developments, domestic livestock grazing, and mineral developments. |
| Challenge | Represents the degree to which an area offers opportunity to test one's self-reliance, outdoor skills, and ability to meet the challenges put forth in a remote primitive setting. |
| Unique Characteristics | Those special geological, biological, ecological, cultural, or scenic features that may be located in the area. |
| Recreational Opportunity | An area's capability of providing primitive and unconfined types of recreation such as camping, hunting, fishing, hiking, riding, etc. |
| Outdoor Education | Refers to an areas ability to provide outdoor education and scientific study both formal and informal. |

Design Criteria and Monitoring

The following handbooks, manuals, etc. provide direction for design and construction of recreation trails, campgrounds, trailheads etc. They also contain the specifications for control of erosion, dust, etc. during construction and maintenance activities.

- ◆ Forest Service Manual 2300, Chapter 2350.
- ◆ Forest Service Handbook 2309.18 - Trail Management Handbook.
- ◆ Forest Service Standard Specifications for Construction of Trails (EM7720-102).
- ◆ Federal Highway Administration Standard Specifications for Construction of Roads and Bridges.
- ◆ Forest Service Supplemental Specifications (this is a supplement to the federal highway specifications).
- ◆ Forest Service Handbook 2509.22- Soil and Water Conservation Practices Handbook.

Monitoring of the preferred alternative would be carried out through:

- ◆ Trail condition surveys which are used to assess trail condition and maintenance needs. Twenty percent of all trails are surveyed annually.
- ◆ Installation of trail counters to track where and how much use the trail is receiving.
- ◆ National Visitor Use Monitoring Project (NVUMP). This survey is used to identify recreation use pattern levels /trends for developed and dispersed recreation. The NVUMP surveys are completed every five years.

Alternative G – No Action

Direct and Indirect Effects: With no trail extension under this alternative, roadless characteristics of the IRAs in the analysis area would remain unaffected, and the ability of these IRAs to be recommended for wilderness designation would remain intact.

Recreation activities would remain unaffected. Existing recreation activities, such as hiking, mountain biking, dispersed camping, hunting, etc., would continue. In keeping with national trends on National Forest System lands, recreation on the Little Missouri National Grassland would continue to increase. Access to areas such as Moody, Kendley, and Cliff's Plateaus would continue to be on foot, horseback, or mountain bike. Motorized use of the analysis area would continue for livestock grazing allotment administration and for emergency purposes.

For those individuals seeking relatively large areas with limited or no access in terms of trails, this alternative would provide a high quality recreational experience. However, for those lacking the skills or confidence to travel unmarked landscapes, lack of access under this alternative may not provide a quality recreational experience.

Cumulative Effects: Because this alternative doesn't create any significant direct or indirect effects and because it doesn't have an additive effect to the impacts from past, present, and reasonably foreseeable actions, there are no significant cumulative effects for this alternative.

Alternative H – Proposed Action

Direct and Indirect Effects

Inventoried Roadless Areas: Under this alternative, approximately two to three miles of the trail are located in the northwest corner of the Tracy Mountain IRA and eight to ten miles in the Kendley Plateau IRA.

Table 3-6. Direct and indirect effects of the proposed action on roadless characteristics.

| Roadless Characteristic | Direct and Indirect Effects |
|--------------------------------|--|
| Solitude and Serenity | <p>The trail would cross the northern end of the Tracy Mountain IRA and along the southwest side of the Kendley Plateau IRA, which encompasses portions of Kendley and Cliffs plateaus. Due to the rugged terrain of these IRAs, the opportunity for solitude and serenity is high. Visitors should be able to isolate themselves in the buttes, removing themselves from the sights and sounds of others.</p> <p>Construction noise and activity associated with building of the trail would likely reduce the amount of opportunities to enjoy the solitude and serenity along the trail route. These actions however, are temporary in nature. Trail maintenance will be of a nonmotorized and should have little effect.</p> <p>Construction of the trail would allow easier access into both IRAs resulting in an increase in the number of recreationists, human-generated noise, and visuals effects such as those generated from reflective surfaces. These impacts, singularly or in combination, have the potential to reduce solitude and serenity in portions of the IRAs. Effects from these activities vary from a few feet either side of the trail for someone speaking to several miles for a reflection. The degree of effect is directly related to the number of trail users, which is an unknown quantity. If we assume the MDH II trail is likely to receive similar use as the existing MDH, we can use recent trail count information to produce an idea of use.</p> |
| Solitude and Serenity, cont. | <p>Trail counts from 2005 showed that approximately 5,120 people utilized the MDH trail. We have no information that trail users' abilities</p> |

| Roadless Characteristic | Direct and Indirect Effects |
|----------------------------------|---|
| | to experience solitude and serenity on the trail have been adversely affected by this amount of use. Given the size of the IRAs, the rugged terrain, and no evidence of adverse effects associated with the MDH trail, the overall solitude and serenity offered by both IRAs would not be significantly affected. |
| Natural Appearance and Integrity | <p>This alternative would result in the mowing and or construction of a trail tread varying in width from 12 to 36 inches, depending on terrain, with an average width of 18 inches through portions of the IRA. Where necessary, waterbars would also be installed. Reassurance markers, 4" x 6" x 5' above ground treated posts, branded with the MDH symbol and mile markers, attached to the reassurance markers would also be installed. In the Kendley Plateau IRA, 20 to 60 foot bridges, for foot and horse traffic, would be constructed over Bear Creek and Tom's Wash. A low water crossing would be constructed at Hanley Wash. No other construction related to this alternative would occur in either of the IRAs.</p> <p>These activities would have a localized effect through the removal of vegetation and disturbance of the soil surface to create a trail tread, construct a low water crossing, or to build abutments for a bridge. Construction of the bridge abutments or a low water crossing would disturb, at most, a quarter of an acre of ground. All disturbed areas are seeded with native species.</p> <p>Under this alternative, there would be some effect to the soil and vegetation resources of the areas. Assuming an average trail width of 18 inches and approximately 14 miles of trail in the IRAs, approximately 2.5 acres of surface would be disturbed. If the low water crossing and footbridges are added, at a quarter acre each, an additional 0.75 acres would be disturbed. The proposed bridges would be of wooden construction, would have a low profile, and would be subordinate to the surrounding landscape. So while they might have a visual impact in the immediate area of the bridge, they would not have a significant effect on this roadless characteristic. Given this small amount of disturbance, natural revegetation, required seeding with native species, trail construction standards for erosion control, and soil and water Best Management Practices (BMPs), there would be no significant effect to the natural appearance or the integrity of either IRA.</p> |
| Challenge | Construction of a trail and stream crossing structures would provide easier access into portions of both IRAs. To a degree, this would diminish the chance to test outdoor skills and self-reliance in unmarked landscapes in the southwestern portion of the Kendley Plateau IRA and the northwest portion of the Tracy Mt IRA. The challenge associated with the remainder of the IRA would not be affected by the proposed action. |
| Recreational Opportunity | Although a foot trail may make access to parts of the IRAs easier than cross country travel, it would not significantly impact either IRA's ability to provide primitive and unconfined types of recreation. There is ample opportunity for cross-country excursions which would not encounter the trail. |

| Roadless Characteristic | Direct and Indirect Effects |
|--------------------------------|--|
| Unique Characteristics | The unique scenic nature of these IRAs revolves around the rugged topography of the badlands. The construction of the proposed trail would not have a significant effect to the badlands. Both IRAs would retain a Scenic Integrity Level (SIL) of High, and their ROS classifications of Semi-Primitive Nonmotorized would remain intact. |
| Outdoor Education | By increasing the relative ease of access into a remote area, the trail may increase the ability of the IRAs to provide outdoor education opportunities. |

Recreation Experience: A high quality recreation experience is a somewhat subjective issue. The ID Team defined a high quality recreation trail experience as a trail that visits a diversity of landscapes, provides for different types of scenery and diverse panoramic views, traverses different types of vegetation, and provides opportunities for solitude along the trail. For this analysis, these attributes were used to analyze the quality of recreation experience afforded by each alternative.

The following table summarizes analysis information for Alternative H. The complete analysis is contained in the Recreation specialist report, located in the project record.

Table3-7. Effects of Alternative H on the four aspects of recreation experience.

| Recreation Experience | Alternative H |
|--|---|
| Diversity of landscapes | This alternative offers the trail user a variety of ever-changing views as the trail twists, turns, climbs, and drops through the Badlands Geographic Area. Elevation changes provide different degrees of challenge for a variety of trail users ranging from mountain bikers to horseback riders. |
| Types of scenery and panoramic views | The higher elevations provide expansive panoramic views of buttes, plateaus, the Little Missouri River, and badlands topography in general. |
| Different types of vegetation | The trail covers most of the vegetation diversity found on the Medora Ranger District, including woodlands, badlands vegetation, and most of the grasses, shrubs, and trees found on the Little Missouri National Grassland. |
| Opportunities for solitude along trail | The diversity of the topography that the trail crosses provides many opportunities for the trail user to find places that offer a feeling of solitude and serenity. This is especially true in the remote Cliffs and Hanley Plateau areas. |

Under this alternative, the proposed Coal Creek campground would be constructed. The construction of the campground, access road, and access trail to the MDH II trail would disturb 3.1 acres. The campground would increase the amount of developed recreation offered to the public, which might reduce the number of user-created, dispersed recreation sites in the area. The campground would provide the public with a source of easily accessible potable water, which is a scarce commodity in this part of the Medora Ranger District. The increase in developed sites would offer recreationists not accustomed to tenting and rustic amenities another avenue to exploring the badlands and other areas of the district. Developing the Coal Creek campground would have a beneficial effect on the Medora recreation program.

Under this alternative, the five trailheads and their approaches would each disturb less than a quarter of an acre of ground. The parking areas account for almost all the disturbed area. The parking areas would be graveled to minimize erosion. The trailheads would provide access along the trail for recreationists and also serve as points of information through use of the kiosks located at each trailhead. The five trail heads would be constructed immediately adjacent to exiting major roads and will be a benefit for the recreation resource. There would be no significant adverse effect on soils, hydrology, wildlife, or botanical resources.

Cumulative Effects

Past: Past actions, such as settlement and oil and gas development, “opened up” the country side, which fostered dispersed recreational use of the grasslands encompassing such activities as picnicking, berry picking, and hunting. The largest single past event in the analysis area was the 1862 Homestead Act, which enabled pioneers to acquire 160 acres of western land for a small filing fee and by living on the parcel for five years (a process called “proving up”). By 1960, past activities including livestock grazing, farming, oil and gas development, road construction, construction of range facilities, and the creation of two-track roads had modified the landscape.

Current: Present actions within the analysis area focus primarily on livestock grazing, oil and gas development, and some road construction, which is generally tied to oil and gas development. Of these activities, oil and gas development have probably had the most affect on recreation. The development of roads, well pads, pipelines, and production facilities has provided access to areas that formally offered nonmotorized dispersed recreation opportunities. Production sounds, daily truck traffic, dust, and escaping H₂S have likely reduced the quality of dispersed recreation opportunities and changed the ROS setting to that of a more developed nature in the northern portion of the analysis area where most of the current oil and gas activities are located.

Livestock grazing has occurred in the analysis area for over a century and continues today. As part of livestock management fences, water developments, and other range facilities are maintained throughout the analysis area. These features can reduce the semi-primitive nonmotorized recreation experience for some recreationists. Under the current DPG Plan, grazing permittees are allowed motorized access to the entire analysis area including all of the IRAs. The effect of this can be the occasional loss of the feeling of solitude and serenity as a rancher rides by in a remote area where a recreationist thought he or she was alone.

Reasonably Foreseeable Actions: Reasonably foreseeable future actions in the analysis area are likely to be similar to those currently taking place, with oil and gas having the highest potential to affect recreation. A large share of the northern half of the analysis areas is under oil and gas lease or is available for leasing. Existing or new leases in the Tracy Mountain and Easy Hill IRAs could cause the IRAs to no longer meet the roadless characteristics, which would then preclude them from consideration for inclusion into the National Wilderness Preservation System. If oil and gas development continues, dispersed nonmotorized recreation opportunities would decrease. Recreation may change to more of a developed nature as the ROS setting would likely change to a more developed class. The southern portion of the analysis area, which consists primarily of the Kendley Plateau IRA, does not contain oil and gas leases; it would maintain its roadless characteristics.

It is possible that future trails would be connected to the proposed trail; however, no trails have been proposed nor has the NEPA process been initiated for any new trail associated with this proposal.

Summary

Under this alternative, construction of the trail would remove vegetation and expose soil in the creation of the trail tread and stream crossing structures. Assuming an 18 inch tread, the 46 mile trail would disturb approximately 8.4 acres. Along the route eight trail structures (i.e. 20 to 60 foot/horse bridges or low water crossings) would be constructed; each may disturb up to a quarter acre of surface, for a total of 2 acres of disturbance. These actions may result in some minor temporary erosion but trail design measures such as installation of water bars and the revegetation of disturbed areas, with native species, would mitigate these concerns. This alternative in conjunction with past, present, and future activities would not have a significant adverse cumulative effect on the surface resources of the analysis area or dispersed or developed recreation opportunities.

Construction of the Coal Creek campground would disturb 3.1 acres but would not have any significant erosion concerns due to sediment control mitigation measure contained in the construction stipulations and a requirement to follow soil and water BMPs. The campground would offer new developed recreation opportunities to the public. Although constructed with the thought of providing developed facilities for MDH II trail users, the campground would likely receive use by others not associated with the trail (e.g., hunters and sightseers).

Alternative H would encourage recreational user access to front as well as backcountry areas that currently receive limited use including the Kendley and Tracy Mt. IRAs. While this action would result in the loss of some opportunities for solitude and serenity offered by these areas, it would not cause the loss of this roadless characteristic in the IRAs nor significantly affect areas outside the IRA. The trail may decrease the “Challenge” offered by the IRAs but not to a significant degree. All the other wilderness characteristics in the IRA would be unaffected or, as in the case of outdoor education, the trail could prove a benefit. The actions from this alternative, in conjunction with past, present and reasonably foreseeable activities, would not preclude the Kendley Plateau or Tracy Mountain IRAs from future consideration for inclusion into the National Wilderness Preservation System. This alternative, in conjunction with past, present and future activities, would not have a significant adverse cumulative effect on the surface resources of the analysis area or dispersed or developed recreation opportunities or IRAs.

Alternative B

The following two tables list the direct and indirect effects from Alternative B on IRAs and recreation experience, respectively.

Table 3-8. Direct and indirect effects of the Alternative B on roadless characteristics.

| Roadless Characteristic | Direct and Indirect Effects |
|----------------------------------|--|
| Solitude and Serenity | <p>Under this alternative the nonmotorized trail would travel along the southwest side of the Kendley Plateau IRA and along the very western edge of Tracy Mt., for about a mile. Due to the rugged terrain of this IRA, the opportunity for solitude and serenity is high.</p> <p>The effects on solitude and serenity for Alternative B are the same as Alternative H with one exception. Because Alternative B is located below Cliffs Plateau, it comes within several hundred yards of Forest Highway (FH) 3 in places. In these areas, the road would adversely affect a person's ability to experience solitude and serenity.</p> |
| Natural Appearance and Integrity | <p>The effects on this roadless characteristic are the same as those identified in Alternative H.</p> <p>Alternative B would disturb a total of 2.7 acres (vs. 3.25 for Alternative H) in the construction of approximately 11 miles of trail and three trail stream crossing structures</p> |
| Challenge | <p>Construction of a trail and bridges/low water crossings provides easier access into portions of the IRAs. As such the chance to test outdoor skills, and self-reliance related to unmarked landscapes is diminished in the southwestern portion of the Kendley IRA.</p> <p>Challenge in the Tracy Mountain IRA may be affected to a small degree. The challenge associated with the remainder of the IRA would not be affected by the proposed action.</p> |
| Recreational Opportunity | Same as Alternative H. |
| Unique Characteristics | Same as Alternative H. |
| Outdoor Education | Same as Alternative H. |

Table 3-9. Direct and indirect effects from Alternative B on recreation experience.

| Recreation Experience | Alternative B |
|--|---|
| Diversity of landscapes | The landscapes visited under Alternative B are generally the same as those under Alternative H. |
| Types of scenery and panoramic views | <p>While this alternative visits many of the same landscapes as Alternative H, it differs on several accounts. It bypasses almost all of the Tracy Mt IRA and in doing so it travels through a developed area containing the greatest concentration of oil and gas wells of any of the alternatives.</p> <p>This alternative also routes the trail below Cliffs Plateau, which is some of the most remote country on the district. The effect of these actions is a loss of scenery opportunities and panoramic views associated with Cliffs Plateau.</p> |
| Different types of vegetation | Same as Alternative H |
| Opportunities for solitude along trail | This alternative would offer fewer opportunities to experience solitude and serenity than Alternative H due the trail being located below Cliffs Plateau and its proximity to FH 3 in places. |

The proposed Coal Creek campground and trailheads would also be built under this alternative. Effects are the same as those identified under Alternative H.

Cumulative Effects: Under this alternative, the total length of the trail would be approximately 39 miles and would disturb 7.1 acres. Alternative B would also have one less stream crossing structure so total disturbed area associated with these structures would be 1.75 acres versus 2 acres under Alternative H. Other than this, cumulative effects associated with this alternative are the same as those described under Alternative H.

Alternative E

The following two tables list the direct and indirect effects from Alternative E on the Easy Hill IRA and recreation experience, respectively.

Table 3-10. Direct and indirect effects of Alternative E on roadless characteristics.

| Roadless Characteristic | Direct and Indirect Effects |
|----------------------------------|--|
| Solitude and Serenity | Under this alternative, the trail would travel the length of the Easy Hill IRA. Given that the trail, under this alternative, is located on Rolling Prairie, it would likely have little effect on the IRA's ability to provide high quality solitude and serenity because of the open nature of this area. The IRA currently has a generally moderate ability to provide solitude and serenity opportunities due primarily to existing structures, roads, etc. which are visible due to the long viewing distances associated with the Rolling Prairie. The effects or construction activities would be similar to those identified in Alternative H. |
| Natural Appearance and Integrity | The effects on natural appearance and integrity are the same as those identified in Alternative H. Alternative E would disturb approximately 0.8 acres (vs. 2.5 in Alternative H) in the construction of approximately 4 miles of trail through the IRA. No stream crossing structures would be installed under this alternative. |
| Challenge | Given the open rolling prairie nature of the IRA, its relatively small size (7,350 acres), and viewable structures and infrastructure, this IRA doesn't provide a high level of challenge. The construction of a trail is unlikely to have any significant effect on the challenge of the IRA. The open nature and small change in topographic relief would generally offer little challenge to mountain bikers. |
| Recreational Opportunity | Same as Alternative H. |
| Unique Characteristics | The unique character of this IRA is that of a rolling prairie. The construction of the proposed trail would not have a significant effect on that. The IRA would retain a Scenic Integrity Level (SIL) of low and their ROS classification of semi-primitive motorized would remain intact. |
| Outdoor Education | Given the relative ease of accessing this IRA, a trail would have little or no effect on the area's ability to provide outdoor education opportunities. |

Table 3-11. Direct and indirect effects from Alternative E on recreation experience.

| Recreation Experience | Alternative E |
|--|---|
| Diversity of landscapes | This alternative offers the highest landscapes diversity because it traverses both Badlands and Rolling Prairie Geographic Areas. |
| Types of scenery and panoramic views | This alternative offers a variety of viewing scenery associated with both of the geographic areas; however, it has rather long expanses of the same type of terrain and vegetation which limit viewing diversity in some areas. This is true of the Davis Creek and Easy Hill IRA portions of the trail and would tend to reduce the quality of the recreational experience. While this alternative offers panoramic views in both geographic areas, they are fewer in number and can be somewhat monotonous such as in the drainage bottom of Davis Creek and the rolling prairie of the Easy Hill IRA. Due to the lack of elevation and by bypassing the most rugged terrain such as that found in the Kendley IRA, some opportunities for expansive, high-elevation, quality panoramic views of the badlands geographic area are foregone under this alternative. The open nature and small change in topographic relief in the Rolling Prairie Geographic Area would generally offer little challenge to mountain bikers. |
| Different types of vegetation | Because this alternative visits both Badlands and Rolling Prairie Geographic Areas, it offers the greatest opportunity to observe the full range of vegetation located on the Medora District. |
| Opportunities for solitude along trail | This trail has potential for solitude and serenity in breaks and drainages of the badlands portions of the trail. The rolling prairie portion of the trail provides only a moderate potential for solitude and serenity. This is due primarily to visible developments including oil wells, roads, livestock grazing, and ranch activities. |

Cumulative Effects: Under this alternative, construction of the trail would remove vegetation and expose soil in the creation of the trail tread and construction/installation of stream crossing structures. Assuming an 18-inch tread, the 29-mile trail would disturb approximately 5.1 acres. Along the route, three trail structures (20 to 60 foot/horse bridges or low water crossings) would be installed; each may disturb up to a quarter acre of surface for a total of 0.75 acres of disturbance. These actions may result in some minor temporary erosion but trail design measures (e.g., installation of water bars and the revegetation of disturbed areas with native species) would mitigate these concerns. This alternative, in conjunction with past, present, and future activities, would not have a significant adverse cumulative effect on the surface resources of the analysis area or dispersed or developed recreation opportunities.

The past, present, and reasonably foreseeable actions for Alternative E are essentially the same as the other two alternatives. One difference is that Alternative E would traverse through the Easy Hill IRA rather than the Kendley Plateau and Tracy Mountain IRAs. Easy Hill is managed under MA 3.65 direction, which allows oil and gas development, and portions of the IRA are currently under oil and gas lease. Given the rolling prairie nature of the IRA and open vistas, oil and gas development could eventually reduce the wilderness characteristics of the

IRA to the point that it would no longer qualify for inclusion in the National Wilderness Preservation System.

Because of the open nature and naturally easy access to the Easy Hill IRA, this alternative would have little if any effect on the challenge provide by the IRA. The trail would have no effect on the IRA's ability to provide recreational or education opportunities. Construction of a trail in the Easy Hill IRA would likely mean some opportunities for solitude and serenity would be foregone. The open nature of the IRA would allow trail activities to be seen or heard for relatively long distances. However, the opportunity to find areas offering solitude would remain, and the trail would not affect the integrity, appearance, or uniqueness of the rolling prairie.

Wildlife

Species and Existing Habitats and Conditions

This analysis tiers to the Final Environmental Impact Statement for the Northern Great Plains Management Plan Revisions, (USDA Forest Service 2001a). Information on species and habitats on or near the LMNG is taken from that document unless otherwise noted.

A) Species Analyzed but Dropped from Further Analysis

The following table lists species that were analyzed but dropped from additional analysis in the document. The reasons for not continuing analysis for these species are also provided.

Table 3-12. Species dropped from further analysis and rationale for their exclusion.

| Species | Reason for dropping from analysis |
|---|--|
| Federally listed species | |
| Whooping crane (endangered) | There would be no effects. Use in the analysis area is so rare that it is not possible to quantify the amount of potential and suitable habitat. Foraging and roosting stops on or near the LMNG are uncommon and considered incidental (NGP 2001a). |
| Black-footed ferret (endangered) | There would be no effects for black-footed ferrets. Black-footed ferrets do not currently occur in the analysis area or within the LMNG; current prairie dog colony acreage and juxtaposition in the analysis area are not considered sufficient to support ferret populations. |
| Bald eagle (threatened) | There would be no effects to the bald eagle. There is currently no nesting on the LMNG; use of the LMNG is migratory; and the proposed trail would be located well to the east of the Little Missouri River corridor (potential nesting habitat). |
| Forest Service Sensitive species | |
| Peregrine falcon | There would be no impacts for the peregrine falcon. There is no known active breeding by peregrine falcons in the analysis area and their current use of the LMNG is migratory. |

| Species | Reason for dropping from analysis |
|--|---|
| Baird's sparrow | There would be no impacts to the Baird's sparrow. The analysis area, particularly the trail route, provides marginal habitat and the project would disturb an insignificant amount of vegetation. |
| Burrowing owl | There would be no impacts to the burrowing owl. This species is not known in the analysis area, and the area lacks potential habitat. |
| Sage grouse | There would be no impacts to the sage grouse. There are no known sage grouse occurrences in the analysis area and little suitable sagebrush habitat. |
| Loggerhead shrike | The proposed trail extension "may impact individuals or their habitat but would not contribute to a trend towards federal listing or cause a loss of viability in analysis area." Project activities would disturb very little vegetation; the analysis area does not provide preferred habitat; and recreational activities (i.e., potential disturbance) would be intermittent. |
| Long-billed curlew | All the alternatives "may impact individuals or their habitat but would not contribute to a trend towards federal listing or cause a loss of viability to the population or the species." Project activities would disturb very little vegetation; recreational activities would be intermittent; and there is little habitat within the analysis area. |
| Sprague's pipit | All the alternatives "may impact individuals or their habitat but would not contribute to a trend towards federal listing or cause a loss of viability to the population or the species." Project activities would disturb very little vegetation and recreational activities would be intermittent. |
| Black-tailed prairie dog | There would be no impacts to prairie dogs from the proposed action. There is only one colony (Handley's Plateau) within ½ mile of Alternatives B and H; there are no towns associated Alternative E. |
| Dakota skipper (sensitive and candidate) | There would be no impacts to the Dakota skipper. The skipper has not been located in the analysis area or in Billings or Slope Counties. |
| Ottoo skipper | All the alternatives "may impact individuals or their habitat but would not contribute to a trend towards federal listing or cause a loss of viability to the population or the species." Project activities would disturb very little vegetation. |
| Regal fritillary | There would be no impacts to the regal fritillary. Project activities would disturb very little vegetation and this species has not been located in Billings County. |
| Tawny crescent | All the alternatives "may impact individuals or their habitat but would not contribute to a trend towards federal listing or cause a loss of viability to the population or the species." Project activities would disturb very little vegetation even where they may cross suitable habitat. |
| Sturgeon chub | There would be no impacts to the sturgeon chub. None of the alternatives would impact potential habitat or populations. |

| Species | Reason for dropping from analysis |
|-------------------------------------|---|
| Northern redbelly dace | There would be no impacts to the northern redbelly dace. The proposed trail would not impact potential habitat or populations. |
| Management Indicator Species | |
| Plains sharp-tailed grouse | There would be insignificant, if any, impacts to sharp-tailed grouse from the alternatives or indirectly through trail use. Project activities would disturb very little potential habitat, and recreational activity is very unlikely to significantly impact breeding activities on leks. |
| Raptors | |
| Merlin | There would be no effect on merlin. There are no known merlin nest sites in the analysis area. Very little vegetation would be disturbed, and the alternatives would traverse few potential merlin nesting areas. Potential nest sites are likely to be screened by vegetation or topography. |
| Ferruginous hawk | There would be no effect on ferruginous hawks. There are no known ferruginous hawk nest sites. |

B) Species Carried Forward in the Analysis

Key areas for bighorn sheep include areas that are important to maintain a healthy and viable herd. Two types of key areas are identified within the analysis area: lambing and a summer ram mixing area. Lambing areas are critical (Wiedmann 2006) for sheep populations to maintain their numbers. The summer habitat is important for genetic purposes. In the LMNG badlands, these areas are often associated with plateaus and/or ridge tops and associated steep areas (slopes of 27 to 85 degrees).

Table 3-13. Species carried forward in the analysis.

| Forest Service Sensitive Species | |
|---|---|
| Bighorn sheep | All action alternatives "may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species." All action alternatives traverse through a portion or portions of the habitat area for the southern meta-population of North Dakota's bighorn sheep herd. |
| Raptors | |
| Golden eagle | This species would be carried forth through the analysis. One nest is at risk from disturbance. It meets the DPG Plan definition of "active," and raptors are sensitive to human presence. |
| Prairie falcon | This species would be carried forth through the analysis. There are two identified nests in the project area, and raptors are sensitive to human presence. |

Desired Condition

Overall desired condition for wildlife species and habitat is described in the DPG Plan. More specific direction for bighorn sheep includes:

- ◆ Sustain viable populations. North Dakota Game & Fish (2202) defines this as 125 animals for the southern meta-population.
- ◆ Ensure an abundant supply of food and cover.
- ◆ Ensure desired levels of solitude.
- ◆ Maintain integrity of lambing, breeding, and other important habitat features.

There are no specific desired condition statements for raptors within the DPG Plan. However, the “ecological conditions to sustain viable populations” (USDA Forest Service 2001b) would be much the same as that for bighorn sheep. Like sheep, raptors are sensitive to disturbance, hence the desired condition for solitude as well.

Methodology for Analysis

Information from a variety of sources was used to compile the existing condition. These sources include existing information in GIS, district records, literature, North Dakota Game and Fish (NDGF) reports, personal communications, field surveys, and the Northern Great Plains FEIS (USDA 2001a). This information was used to develop mitigation or design criteria or to help in making a determination call for Sensitive species, MIS, raptors, etc. Much of the analysis was done spatially in GIS by comparing known locations with the proposed trail layout. If species locations were unknown or ubiquitous, literature, personal communications, and knowledge of species habitat or behavior were used to make determinations on effects from the proposed action.

This analysis primarily addresses potential wildlife issues posed by the proposed trail. The wildlife species of interest include bighorn sheep, golden eagles, and prairie falcons. However, a preliminary analysis was completed to make a determination of effect for other Sensitive species, Threatened and Endangered species, Management Indicator Species, and raptors.

The wildlife analysis area will be defined as the following Township/Range areas. Generally, this area is east of the Little Missouri River from Sully Creek Campground and south to the Burning Coal Vein Campground. This would include all or portions of the following townships:

- ◆ T139 R102 and R101;
 - ◆ T138 R102 and R101;
 - ◆ T137 R102 and R101;
 - ◆ R136 R102 and R101.
-

Environmental Consequences

Effects Common to All Alternatives

Under all alternatives, nonmotorized, off-road travel is prohibited except for ranchers who are allowed to use motorized vehicles in the administration of their grazing allotment, and occasionally Forest Service employees may utilize vehicles to administer remote, backcountry areas. Cross-country access is also allowed for emergencies and under some oil and gas activities. The extent of the unrestricted and unauthorized off-road travel in the analysis area is unknown. Impacts from this use are likely very sporadic and incidental and not significant for bighorn sheep unless they occur in key areas.

Cross-country motorized travel may also affect raptor nesting. Effects would likely be very sporadic and incidental but could be potentially significant if they cause nest abandonment.

Design Criteria and Monitoring

If mechanical means are planned for trail construction, then no mechanical construction activities may occur within ¼ mile of the golden eagle and prairie falcon nests located in section 31 and 30/T139/R101, from February 1 to July 15, unless nests are determined to be inactive prior to construction.

There is no specific planned Forest Service wildlife monitoring plan necessary for this project. The NDG&F constantly monitors the bighorn sheep population. NDG&F data and observations will be used to consider adjustments in trail usage or trail placement, if necessary, to maintain the habitat, viability, and vitality of the southern meta-population herd.

Alternative G – No Action

Direct and Indirect Effects: Since no trail or campground would be constructed under this alternative, no direct or indirect effects to key **bighorn sheep** areas are expected. However, some effects may still occur (see Effects Common to all Alternatives). With no trail extension, this alternative would potentially provide the best opportunity for solitude for bighorn sheep population within the southern meta-population herd.

There would be no expected direct or indirect effects to **golden eagle or prairie falcon** habitat, known nests, or the population. . However, some effects may still occur (see Effects Common to all Alternatives).

Cumulative Effects: Since there would be no direct or indirect disturbances resulting from this alternative, there will be no cumulative effects from Alternative G.

Alternative H – the Proposed Action

Direct and Indirect Effects: Impacts from the trail and users will create no significant impacts to **bighorn sheep** habitat or the population. The trail was strategically placed to avoid known key bighorn sheep areas. The closest known key area is approximately 0.8 mile from the trail. This, coupled with the broken badlands terrain, would likely deter all but the most determined visitor from encroaching on this or other key areas. Since knowledge of key areas is limited to just a few individuals (primarily state and federal government employees) and the

critical lambing takes place early in the recreational season, disturbances of lambing sites would likely be accidental. The bighorn sheep southern meta-population is not expected to be impacted under this alternative. The determination is “may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.”

The risk of disturbance to known **raptor nests** is unlikely, since the nest cliffs are topographically screened from the trail. This, coupled with the distance to the nest from the trail (approximately 800 to 1,500 feet), will significantly reduce the odds of impacts from trail users. If disturbance were to occur to the known raptor nests, impacts could potentially be significant if the disturbance occurs during one of the following times:

- ◆ From just prior to egg laying to just after onset of incubation.
- ◆ From hatching to when young become endothermic: 5 days in most raptors.
- ◆ The last few days before young fledge.

This alternative used avoidance and topography to separate the trail user from the nesting cliffs to mitigate possible impacts to the nests. It is possible a trail user may wander off the trail and disrupt a nest. If a particular nest was active, this could result in the abandonment of the nest and lost reproductive opportunity for that year.

The Coal Creek campground would have no significant effect on bighorn sheep. The proposed Coal Creek campground would be located eight-tenths of a mile or more from the nearest bighorn sheep key area and approximately one mile from the key sites within the key area. The terrain between the campground and key area is that of broken badlands which tends to discourage casual cross-country walks. Between the key area and the campground, there is a major road (FH3) which bighorn sheep don't like to cross. There is always the chance of a casual encounter between a campground user and a bighorn sheep, but it is a minimal concern. There are no raptor nests affected by the proposed campground.

Cumulative Effects: Past, present, and reasonably foreseeable future actions are described in Table 3-1. Past and present activities have likely had an effect on raptors and sheep over the last 50 years. As noted earlier, future oil and gas exploration and development, livestock grazing administration, dispersed recreation, etc. may continue to potentially affect bighorn sheep and raptor habitat and/or populations.

There are no significant cumulative adverse effects to bighorn sheep, golden eagles, or prairie falcons associated with this proposal. The proposed trail has the potential to affect these wildlife species. However, the trail route design effectively mitigates potential impacts to bighorn sheep and raptors. The trail route has been placed to effectively avoid key bighorn sheep areas using distance and badlands terrain. The known golden eagle and prairie falcon nest sites are topographically screened from the trail. Although incidental encounters may occur with wildlife along the trail, key bighorn sheep areas and nesting sites are avoided through trail design.

Alternative B

Direct and Indirect Effects: The determination for **bighorn sheep** under Alternative B is “may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.” Bighorn sheep populations are not expected to be impacted under this alternative. Alternative B avoids known key bighorn sheep areas similar to Alternative H. Bighorn sheep react more strongly to threats above them than to threats below them. Hence, Alternative B mitigates potential impacts to bighorn sheep and their habitat on Cliffs Plateau by staying below the rim of the plateau. Like the other action alternatives, avoidance of known keys areas is enhanced by terrain, distance, or by major roads.

There will be no impacts to **raptors** from Alternative B; it poses no risk to known raptor nests in the analysis area.

The effects of the proposed Coal Creek campground on wildlife are the same as those identified under Alternative H, above.

Cumulative Effects: There are no significant cumulative adverse effects to bighorn sheep associated with this proposal. See Alternative H Cumulative Effects discussion above for past, present, and reasonably foreseeable activities in the analysis area. Alternative B would not affect the raptor nests in Section 30/31 or any other known raptor nests; therefore, there are no cumulative effects from this alternative to the golden eagle or prairie falcon nests in the aforementioned area. Because bighorn sheep feel less of threat from danger below them, Alternative B’s route below Cliffs Plateau would create less stress for bighorn sheep than Alternative H because trail users would be below them not above them on the plateau.

Alternative E

Direct and Indirect Effects: The determination for **bighorn sheep** for Alternative E is “may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.” Alternative E passes through some bighorn sheep habitat but is not expected to impact key sheep habitat areas. The only exception may be at the very north end of the analysis area. However, the potential risk of disturbance is considered to be negligible for the following reasons: the lambing area is located across a major road (FSR #739), the lambing area is located on private property, and there would be about a mile separation between the trail and lambing area.

It is unlikely Alternative E would have any impact on **golden eagles or prairie falcons**. Under this alternative, the proposed trail traverses within one mile of five known golden eagle nests but no known prairie falcon nests. Of the five golden eagle nests along this route, three would be shielded by badland terrain; one more was recorded 22 years ago as a fallen nest; and the last one was inactive in 1983 and 1984 and could not be located during a field visit in 2006.

There are no proposed campgrounds with this alternative, thus there are no effects associated with campgrounds.

Cumulative Effects: Since there are no direct and an insignificant potential for indirect effects from Alternative E, there will be no significant cumulative impacts to wildlife habitat

or populations from this alternative. There are no wildlife populations or key habitats that would be significantly disturbed by the trail or users.

Wildlife Effects Summary

Table 3-14. Summary of effects to bighorn sheep and raptors by alternative.

| | Bighorn Sheep | | Raptors | Cumulative Effects |
|--|--|---|---|---|
| | Impact to known key areas (lambing, ram summer area) | Determination of impacts to sensitive species | Impact to known raptor nests | |
| Alternative G (No Action) | None | No direct/indirect impact | None | None |
| Alternative H (Proposed Action) | Trail - No Significant Impact because the trail is greater than 0.8 mile from known lambing or ram summer areas. Coal Creek Campground - No Significant Impact because campground is greater than 0.8 mile from lambing area. | “May impact individuals or their habitat but will not contribute to a trend towards federal listing or cause a loss of viability to the population or the species.” | Low: Due to distance and topographic screening, users on the trail would not impact known raptor nests. | Not significant: Users on the trail would have no impact on bighorn sheep key areas or known raptor nests; potential for incidental contact between users on trail and sheep and raptors. |
| Alternative B | Trail - No Significant Impact because the trail is greater than 0.8 mile from known lambing or ram summer areas. Coal Creek Campground - No Significant Impact because campground is greater than 0.8 mile from lambing area. | “May impact individuals or their habitat but will not contribute to a trend towards federal listing or cause a loss of viability to the population or the species.” | None | Not significant: Users on the trail would have no impact on bighorn sheep key areas or known raptor nests; potential for incidental contact between users on trail and sheep and raptors. |
| Alternative E | None | Almost no potential impact to sheep or sheep habitat. | Low | Very low: little additional disturbance to wildlife habitat along trail corridor. |

Botany

Existing Condition

Sensitive species: There are no Threatened or Endangered plant species listed for the Little Missouri National Grasslands (LMNG). However, thirteen species occur on the LMNG Sensitive Plant List, and twenty-three species occur on the list of Watch Plants (USDA Forest Service, 2004). The thirteen sensitive plant species and their general habitat characteristics are provided below. Species that occur in a similar type of habitat or similar soil conditions are grouped in guilds. More detailed information about sensitive plants and their habitat is found in the *Biological Evaluation and Impact Assessment for Botanical Resources in Regards to the Proposed Maah Daah Hey II Trail* on file in the project record.

Table 3-15. Sensitive species occurring in the analysis area for the proposed Maah Daah Hey 2 Trail extension.

| Guild | Sensitive species | Habitat | |
|--------------|-----------------------|---|---|
| Sandy | Smooth goosefoot | Unconsolidated sand, silt, and gravel deposits along the Little Missouri River on the LMNG. Loose sand deposits such as sandstone colluvium, sand dunes, and erosional breaks in sandy soil (sand blowouts) are important population sites in other areas of the species range and are of potential importance on the LMNG. | |
| | Nodding buckwheat | Sand and silt colluvium and sand blowouts. | |
| | Sand lily | Open structure short grass prairie with sandy/silty soil, or open conifer woodlands. | |
| | Alkali sacaton | Sandy/gravelly soils or succession in clay outwash (also listed under the Clay Butte Guild). | |
| Butte Guild | Clay Buttes | Torrey's cyrptantha | Dry open plains, geologic exposures, badland slopes. |
| | | Dakota buckwheat | Erosional breaks with barren clays, claypans, badland slopes and outwash plains, and eroding bedrock. |
| | | Alkali sacaton | Nearly level outwash plains at the base of clay buttes. |
| | Rocky Buttes | Alyssum-leaved phlox | Weathered bedrock, sandy gravelly soil. |
| | | Hooker's townsendia | Non-sandy weathered outcrops, dry short-grass plains and hillsides. |
| Scoria Hills | Dwarf mentzelia | Weathered/fractured scoria bedrock, arid slopes, and sandy plains. | |
| | Limber pine | Shallow soils over fractured bedrock (only one population site on the LMNG and may be cultural in origin). | |
| Mesic | Lance-leaf cottonwood | Floodplains and streambanks. | |
| | Blue-eyed Mary | Open woodland/shrubland with sparse to moderate herbaceous cover. | |
| | Sedge mousetail | Streambanks, vernal pools, moist lowlands. | |

The three action alternatives cross several areas with suitable habitat for most of the sensitive plant species on the LMNG. Three sensitive plant populations were discovered during botanical surveys for Alternative H. The first population involved three Hooker's townsendia plants located along a rutted livestock trail that followed the bottom of a non-wooded drainage valley. This site was very atypical in that dense mid to tall structure grass communities immediately adjacent to the livestock trail are not conducive to the short growth form of Hooker's townsendia that usually occurs in sparsely vegetated habitats on gravelly clay substrates. More suitable clay butte habitat for the species was located on adjacent ridgelines with sedimentary exposures. It is possible that the discovered population dispersed from this area, but surveys along the ridgelines did not result in the discovery of any additional populations.

Another population of Hooker's townsendia was discovered about 15 miles to the south. This population of approximately 60 individuals occurred on a small exposure of gravelly clay around an exposed block of bedrock. The Alternative H trail route was located about 250 feet upslope and west of the site.

A population of approximately 40 nodding buckwheat plants was discovered immediately below the townsendia site on a small erosional break with loose sand. This is the third documented population of nodding buckwheat on the LMNG. Plants were concentrated along the headwall of the cut exposure, and the site is situated about 350 feet east of the proposed trail.

Invasive species: Large populations of leafy spurge occurred along the drainage crossings of Bear Creek and Toms Wash, and around a stock pond south of Toms Wash that has the potential to become a stopping point for hikers. Smaller populations of leafy spurge were noted east of an abandoned scoria pit approximately 0.5 miles east of the proposed Coal Creek Campground. Small patches of Canada thistle were scattered along the crossing of Third Creek and along areas of recent headcutting within tributary drainages of Hanley Wash adjacent to the trail.

Excluding stands of Kentucky bluegrass and smooth brome beneath woody overstories, invasive but non-noxious grasses infest approximately 2,500 acres of grassland habitat within the analysis area. Invasive annual grasses (downy brome and Japanese brome) occurred as monotypic patches along the west edge of Cliffs Plateau. Other prominent annual brome patches were noted at 11 additional locations in the analysis area.

Invasive perennial grasses of smooth brome and Kentucky bluegrass have come to dominate the herbaceous layer within woody draws and drainages across much of the LMNG, including most drainages crossed by all action alternatives. The invasive forb species, sweet clover, tends to occur intermixed with native species, but a prominent and relatively isolated patch occurred on the south side of Davis Creek about 100 feet west of the Alternative H trail crossing.

Noxious weed populations that have been documented and mapped by the Range Program in the analysis area include about 160 acres of leafy spurge, 5 acres of Russian or spotted knapweed, 2 acres of Canada thistle, and traces of wormwood and common mullein.

Desired Condition

General Vegetation Conditions: The desired condition is to maintain the full spectrum of grass, forb, shrub, and tree species inherent to native mixed and short grass plant communities of the northern Great Plains. Disturbance processes would contribute to a shifting mosaic of plant composition and structure over time. The predominant grassland habitat types across the Medora

Ranger District would occur in early, mid, and high seral stage frequencies of approximately 10-15%, 65-75%, and 15-20%. Woody draw communities would exhibit complex structural layers and rates of regeneration that ensure their persistence.

Sensitive Plant Species: Ideally, there would be no sensitive plant populations because there would be a sufficient number of populations of each species and there would be no foreseeable threats to the continued viability of the populations, species, or habitat guilds. Assuming some species could occur only in very unique habitats of which there is a natural scarcity, it would be desirable to have all or a large portion of these habitats occupied by the species. These habitats would receive full protection from adverse impacts and there would be minimal threats from natural disturbances or indirect human perturbations such as invasive weeds.

Invasive Weeds: There would be no non-native invasive weed species that displace native plant species while forming monotypic weed patches and altering the structure, function, and processes of the native ecosystem. Accepting that there are invasive weed species that cannot realistically be eradicated from the landscape, the goal would be to control those species through the use of integrated control program following the guidance provided for treatment in the DPG Noxious Weed FEIS and ROD (anticipated in September 2006).

Methodology for Analysis

Current data of documented sensitive plant populations was reviewed to assess any impacts on known sensitive plant sites for all the action alternatives. Existing GIS layers were analyzed for documented noxious weed populations and any control treatments that have been implemented.

During the fall of 2004 and spring of 2005, botanical surveys were conducted for sensitive plants. The survey followed the Alternative H route, with auxiliary side-trips to adjacent habitat inclusions most suitable for the listed sensitive plant species. The survey period spanned a period of active growth or identifiable litter for most sensitive plant species. Spot surveys were conducted during 2006 in several areas that resulted in a negative survey report during 2004-2005 but that appeared to present especially good quality sensitive plant habitat. Invasive plant populations occurring along Alternative H route were noted during the surveys for sensitive plant populations. It is possible some sensitive plant populations along the proposed route have been missed due to small population sizes or normal fluctuations in population dynamics that can occur with annual forb species.

Environmental Consequences

Design Criteria and Monitoring

The trail was designed to avoid the Hooker's townsendia and nodding buckwheat populations near the south end of the route (Sec 35, T137N, R101W); however, if monitoring indicates that trail and associated recreation activities are impacting these populations, relocation of that portion of the trail should be implemented.

The use of weed-free hay along the trail should be stipulated, and feeding of such hay should be encouraged 2-3 days prior to arrival or use of the trail. Horse manure at campgrounds should be collected and stored in specific locations where it can be monitored and treated for weed species.

Bridge construction over narrow deep channels such as Toms Wash and Merrifield Creek is encouraged. Several highly incised drainage crossings are likely to result in difficulties of trail construction and maintenance, additional erosion immediately adjacent to the channel, potential safety issues related to poor accessibility and flash flooding, and increased opportunities of assisting the spread of existing weed populations, especially with regard to sticky clay substrates that would facilitate seed adhering to travelers and equipment.

Invasive species: Effectively control or limit the spread of invasive species. Mitigate invasive species impacts associated with the proposed trail through control treatments and avoiding existing populations where possible. Utilize strategies in the USDA Forest Service National Strategy and Implementation Plan for Invasive Species Management (2004), and the Guide to Noxious Weed Prevention Practices (USDA Forest Service 2001c), to control invasive species. Treatments should be initiated prior to trail construction to lessen the potential for this activity to disperse propagules along the freshly disturbed route. Monitoring and treatment should then be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness. More site-specific control measures are described in *Biological Evaluation and Impact Assessment for Botanical Resources in Regards to the Proposed Maah Daah Hey II Trail*, on file in the project record.

Alternative G – No Action

Direct and Indirect Effects: Potential impacts to the three discovered sensitive plant populations and the identified suitable sensitive plant habitat would not occur because there would be no disturbance resulting from the proposed trail.

Noxious weed species would continue to be treated within the analysis area and across the LMNG. However, there are no current plans to conduct control treatments for invasive species that are not classified by the state as noxious weeds. Thus, no control measures would be implemented for populations of annual brome, sweet clover, Kentucky bluegrass, and smooth brome under current management. Although these species would have a relatively high potential to spread through natural dispersal mechanisms, there would be a greatly reduced potential for long-distance, human-assisted seed dispersal along the trail corridor.

Alternative H – Proposed Action

Direct and Indirect Effects: The **Hooker's townsendia** population of three plants discovered along the rutted livestock trail in Section 35 (T139N, R102W) is at risk from the proposed recreation trail. However, the atypical habitat characteristics of the site, combined with continued rutting and erosion of the livestock trail on which the three plants occurred, results in a low probability that the population would remain active for more than a few years. With several other documented and widely distributed populations of Hooker's townsendia, the population in question is not critical to continued viability of the species on the LMNG.

The second population of Hooker's townsendia, discovered along the southern portion of the route (Sec 35, T137N, R101W), is unlikely to be directly impacted during trail construction due to its location about 250 feet down slope. However, there is a potential for trampling disturbances (from users straying from the trail) that could impact continued viability of the population. Although this population is not critical for continued viability of the species on the LMNG, it is important for maintaining a wide distribution of the species across the

landscape. The closest other known populations of the species occur about 9 miles to the west and 11 miles to the north.

Potential trampling of the adjacent **nodding buckwheat** site is less likely, but any negative effects to this population would be amplified by the fact that there are only two other known populations of this species on the LMNG.

Portions of the route cross potentially suitable **habitat** for all listed sensitive plant species. Habitat along the trail and immediately adjacent areas would be negatively altered through trail construction and high rates of trampling during the growth season. However, the total trail disturbance in sensitive plant habitat, relative to the total available habitat further from the trail, suggests that most trampling impacts would not severely impact the amount of apparently suitable habitat. In most cases, the proposed trail tends to skirt along the edges of suitable habitat.

Construction, use, and maintenance of the trail have a high potential to assist the spread of **invasive species** along the length of the trail. The spread of weed species is likely to occur during construction and periodic maintenance of the trail as plant cover and surface soils are disturbed and weed seed or root fragments are transported along the project area by vehicles and equipment. Trail users also have a high potential to disperse weeds along the route. Clay substrates along much of the trail become very sticky when wet, and hence, seed of all the identified invasive species could easily adhere to shoes, bike tires, and horse hoofs, and be dispersed along other portions of the trail.

No sensitive plant populations were discovered during the course of two field surveys in the proposed campground area. The construction of the campground would impact sensitive plant habitat, but would be unlikely to lead to federal listing or cause a loss of viability for any species on the LMNG. The area of the proposed Coal Creek Campground contained sensitive plant habitat for the Clay Butte and Scoria Hills Guilds along south aspect exposures above the Coal Creek Drainage. Mesic Guild habitat may be present within a mosaic of ephemerally flooded claypans at the east end of the site suitable for sedge mousetail and alkali sacaton, while dense Rocky Mountain juniper on the north aspect of the ridgeline may be suitable for blue-eyed Mary.

The potential would be moderately high for invasive species to become established in the campground, and thereafter spread to portions of the proposed trail if not controlled. There are minimal occurrences of invasive weed species in the campground area.

Cumulative Effects: An analysis area to assess cumulative effects was constructed by extending a 0.5-mile radius from the proposed route. The resulting analysis corridor is approximately 23,700 acres.

All areas of new disturbance associated with this alternative have at least a moderate potential to become infested with invasive species, with a correlated potential for these infestations to continue expanding outside the area of the trail influence.

Existing and historical disturbances in the analysis area include eleven currently producing oil wells, two water injection wells, one compressor station, three producing wells that are now abandoned and reclaimed, and seven dry oil wells that were immediately abandoned. Most of these sites are located along the first six miles of the north end of the trail, but a few dry and abandoned oil sites are scattered further south. About one-third of the total well sites occur on

private land that is intermingled with National Grassland. Three additional oil wells are currently proposed in the analysis area within two miles of the proposed Coal Creek Campground. All of these oil sites would be assessed by short access roads and the total developments would involve about 10 acres of disturbance.

All of the abandoned or closed oil well sites and access roads have been reclaimed, and the edges of the currently productive sites and access roads have been partially reclaimed. However, recent studies on the LMNG (Washington and Gildar 2004) and current observations indicate that most reclaimed sites from the period of the active and abandoned wells are dominated or co-dominated by invasive grasses such as crested wheatgrass, smooth brome, annual brome, and Kentucky bluegrass. The seven dry and abandoned sites may support a higher percentage of native plant compositions relative to the producing sites.

The total length of surfaced roads in the analysis area is about 22.2 miles, which includes portions of East River Road and numerous side roads that access existing well sites and other portions of the LMNG. Assuming an average width including ditches of 60 ft, the roads comprise an area of about 161 acres. The vegetated road shoulders and ditches comprise about 108 of the 161 acres. Studies in the southwest have shown that invasive species increase along road shoulders proportional to the degree of road development (Gelbard and Belnap 2003), and as a result of invasions or direct planting of invasive grasses, a similar situation occurs on the LMNG (Washington and Gildar 2004, personal observations).

There are numerous pipeline and utility corridors associated with productive well sites that either follow existing road edges or cut cross-country. A large-diameter interstate petroleum pipeline corridor also cuts across the analysis area. Collectively, these various lines are estimated to have affected 51 acres, of which at least half is likely to have been invaded or reclaimed with invasive grasses (personal observations).

This collective area of 454 disturbed acres equates to 1.9% of the analysis area, most of which has been impacted by invasive species. Including both disturbed and undisturbed sites, there are approximately 170 acres of documented noxious weed infestations, and it is estimated that non-noxious invasive species occur on about 2,500 acres.

The trail and immediately adjacent areas have the potential to increase the amount of weed infestations within the analysis area from 1.9 to at least 2.3%. Much of the additional weed infested area would occur in relatively pristine habitats in the southern two thirds of the analysis area that have generally not experienced high levels of ground disturbance and weed infestations. The potential would also exist for new weed infestations in this area to continue expanding off-site. Thus the trail corridor could serve as a means of expanding the present extent of weed invasions throughout the analysis area.

Alternative B

Direct and Indirect Effects: In general, Alternative B would cross a lesser amount or quality of sensitive plant habitat than Alternative H, but the overall direct and indirect effects of the two alternatives would be similar. Under Alternative B, the trail would pass by the same three sensitive plant population sites as Alternative H. Alternative B would avoid almost 4.0 miles of high quality sensitive plant habitat crossed by Alternative H east of East River Road at the north end of the route. Although some sensitive plant habitat may be crossed by the Alternative B route in this area, it is unlikely to be as extensive or as high a quality as that

crossed by Alternative H. A similar situation occurs in the area of Cliffs Plateau at the south end of the route; Alternative B remains in relatively low quality/suitability sensitive plant habitat, while Alternative H crosses the west edge of Cliffs Plateau with high quality habitat.

Moderately extensive annual brome populations along Plumly Plateau and Cliffs Plateau would be avoided by Alternative B, but it is likely that additional populations of annual brome, and perhaps other invasive species, would be encountered. Overall, Alternative B would be likely to result in the same degree of invasive weed impacts as Alternative H.

The Coal Creek campground would have the same effects on botanical resources as those described under Alternative H.

Cumulative Effects: Alternative B has similar potential as Alternative H in regards to spreading invasive weeds into uninfested portions of the LMNG. The north end of the Alternative B analysis area probably contains a slightly greater number or acreage of well sites and other soil/vegetation disturbances that have influenced invasive weed occurrences, but all other portions of the two routes are very similar in terms of past and foreseeable future disturbances.

Alternative E

Direct and Indirect Effects: All three sensitive plant population sites would be avoided by Alternative E, but the first three miles where Alternative E departs from Alternative H would pass close to several Hooker's townsendia populations and a historic population of sand lily. After this point, the middle portions of Alternative E would primarily cross grassland habitat with a lower potential for the occurrence of sensitive plant habitat. Sensitive plant habitat would likely increase along the southern portion of Alternative E along Hanley Plateau, and the final four miles of this route would likely be similar to Alternative H in regards to sensitive plant habitat.

Several areas along the northern portion of Alternative E would pass through or near leafy spurge infestations along Davis Creek, and there are likely to be invasive grass populations of annual brome, crested wheatgrass, Kentucky bluegrass, and smooth brome along central portions of this route. A major portion of these infestations would likely occur in areas that are relatively easy to access.

As there is no campground proposed under this alternative, there would be no effects on botanical resources.

Cumulative Effects: Alternative E passes by fewer oil and gas sites than Alternatives B and H. Thus soil and vegetation disturbances and associated invasive/noxious weed impacts from oil and gas activity would be less than Alternatives B and H. Although the number or acreage of improved surface and two-track roads, broken lands, and livestock infrastructures are similar among all alternatives, there appears to be less occurrence of invasive grass populations associated with these developments along the route of Alternative E. Thus, Alternative E would likely have a lower cumulative effect than Alternatives B and H on botanical resources.

Soil and Water Resources

Regulatory Framework

A number of federal laws executive orders, regulations direct or authorize management of watersheds and soils on lands of the National Forest System (FSM 1021.2). These laws include the following:

- ◆ Bankhead Jones Farm Tenant Act of July 22, 1937, as Amended (7 U.S.C. 1010-1012).
- ◆ Forest and Rangeland Renewable Resources Planning Act of 1974, as Amended (88 Stat. 476; 16 U.S.C. 1601-1614).
- ◆ National Forest Management Act of 1976 (16 U.S.C. 1600-1602, 1604, 1606, 1608-1614).
- ◆ Clean Water Act of 1977 (amended 1987; 33 U.S.C. 1251, 1254, 1323, 1324, 1329, 1342, 1344; 91 Stat. 1566).
- ◆ Executive Order 11514 of March 5, 1970, as Amended by Executive Order 11991, May 24, 1977
- ◆ Title 7, Code of Federal Regulations, section 2.60 (7 CFR 2.60).
- ◆ Forest Service Manual 2500 – Watershed and Handbook 2509 – Soil Management.

A more detailed discussion of each of these laws, regulations, etc. is contained in the Soil and Water Resources Report located in the Project Record.

DPG Plan

The DPG Plan (USDA Forest Service 2001) contains more than 500 standards and guidelines to direct management activities on the Dakota Prairie Grasslands. Those most relevant to soil and water resources and are listed below. The list is not all-inclusive.

Table 3-16. DPG Plan direction applicable to soil and water resources.

| Area* | Plan Page | Resource | Standard or Guideline |
|-------|-----------|----------|--|
| GW | 1-9 | Water | 1. Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health from damage by increased runoff. Standard |
| | | | 2. Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions. Standard. |
| | | | 3. Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem, including quantity and quality of surface and ground water. Standard |
| GW | 1-10 | Water | 6f. Do not allow new roads to parallel streams when road location must occur in riparian areas except where absolutely necessary. Locate crossings at points of low bank slope and firm surfaces. Guideline |
| | | | 7. Design and construct all stream crossings and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life. Standard |

| Area* | Plan Page | Resource | Standard or Guideline |
|-------|-----------|----------|--|
| | | | 8. Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function and meet regulations found in Section 404(b)(1) of the Clean Water Act. The 404 regulations were established by the Environmental Protection Agency and constitute the substantive environmental criteria used in evaluating activities. |
| | | | 8c. Design projects to minimize sediment discharge into streams, lakes, and wetlands. |
| GW | 1-10 | Water | 9. Cross streams at right angles during construction of new roads. Guideline |
| GW | 1-11 | Soils | 2. Stabilize and maintain roads and other facilities sites during and after construction to minimize erosion. Standard |

*GW = Grasslands wide; G/C specific to Grand River and Cedar River National Grasslands; MA = Management Area (see DPG Plan for more information).

Methodology for Analysis

Analysis of environmental impacts is based on North Dakota's list of 303 impaired waters (North Dakota Department of Health, 2004) and soils along the proposed and alternate routes as mapped by the USDA National Resources Conservation Service and available for download from the NRCS Soil Data Mart on the World Wide Web at: <http://soildatamart.nrcs.usda.gov/>.

Existing Condition

The project area is crossed by a few gravel and two-track roads and by numerous wildlife and cattle trails; however, there are no recreational trails. The extent of the original Maah Daah Hey trail extends from Sully's Creek Primitive Campground in Billings County to the CCC Campground in McKenzie County. This trail has proven to have little to no erosion or runoff problems along its 96-mile length, except where it crosses soils with high sand content and segments that cross materials rich in smectite (bentonite, shale, and clay-rich soils).

Desired Condition

In accordance with DPG Plan and Forest Service direction, the construction and maintenance of trails should not alter water or soil quality. Erosion should be minimized and controlled within a year or a few years depending on the rate at which disturbed ground is revegetated. The success of revegetation efforts is climate controlled. The desired soil and water condition is to have minimal erosion and no measurable deterioration in water quality.

Environmental Consequences

Mitigation and Monitoring

Best management practices (BMPs) should be implemented to minimize erosion and degradation of soil and water quality. In addition, trail construction and maintenance should be performed in accordance with standard specifications as described in FS Engineering Manual EM-7720-103 (USDA Forest Service, 1996). EM-7720-103 provides specific guidance on construction of drainage devices (Sections 920-924; pages 31-39), structures,

such as bridges (Sections 930-936; pages 40-54), and surfacing (Sections 940-944; pages 55-64).

Annual trail inspections of at least 20% of the trail will ensure that sections of trail with erosion problems are addressed within a 5-year period. Major problems will be addressed more promptly depending on the nature and severity of the problem.

Alternative G – No Action

Direct and Indirect Effects: The No Action Alternative would pose no additional environmental risks or impairments to soil and water resources in the project area.

In the absence of a dedicated recreational trail, bikers, hikers, and horse riders may seek alternative travel along non-designated routes. This potential for diffuse recreation may lead to disperse resource damage, including erosion, degradation of water quality, development of trails and braided trails, and spread of noxious weeds. Much of this damage may go unnoticed for years given that monitoring may not occur along non-designated routes.

Beaver populations have been expanding dramatically in the past few years. Beaver dams and their associated ponds tend to be dynamic and constantly shifting locations along badlands streams, where sediment load is high and pond longevity is short. Beaver ponds can adversely affect low-water or natural ford crossings, rendering them unsafe as they become mired in quicksand or suspended mud. Bridges would provide safe and reliable stream crossings where beaver activities occur.

Cumulative Effects: There are no known cumulative effects to soil and water resources based on no known direct effects. The indirect effects are speculative at best and not certain.

Alternative H – Proposed Action

The proposed action provides for the construction of stream crossings that should prevent any degradation of water quality after the initial construction period. The proposed trail should funnel recreational use along a designated route and reduce damage caused by unmonitored, dispersed recreation. Bridges that span stream channel and banks would have virtually no adverse effects on stream function or water quality. Low water crossings would require disturbance of channel and bank materials, which would have a short-term (one to a few years) impact on water quality during flow events. The primary impact would be an increase in suspended and bed load, which are naturally high in badlands streams. Low water crossings may have a long-term impact on stream function and water quality as any structure placed within the stream channel has the capacity to create turbulence, eddies, and altered flow patterns, which can cause erosion of the channel and banks.

Direct and Indirect Effects: Impacts to streams should be negligible if natural gravel fords or bridges are used. Low-water crossings may destabilize channels by adding turbulence, eddies, and complex flow patterns. Also, low-water crossings will require constant, long-term maintenance to prevent sediment and debris from obstructing streamflow or movement of aquatic life. As with all trail construction under any alternative, erosion is likely to occur during the construction phase of the trail. Surface hydrology is typically altered by trails, which can capture runoff and concentrate it in the trail. Proper construction of water bars or water diverters can eliminate water from the trail and direct it downslope.

Impacts to soil resources are likely to diminish and become negligible soon after trail construction is completed. Annual inspections and repairs will address problem areas if and when they arise. Areas with sandy soils that are prone to erosion (especially where the ground slope is greater than 6%) should be hardened with rock and water bars should be more closely spaced to reduce effects of surface runoff. Likewise, segments of trail that cross smectite-rich materials (shale, bentonite and clay-rich soils), should be surfaced to permit travel when trails are wet.

Alternatives B and E

With respect to soil and water resources, any trail construction will have the same direct, indirect, and cumulative effects as outlined under Alternative H.

Cumulative Effects – All Alternatives

Some erosion will likely occur during construction phases and during the revegetation process, which generally takes about a year. To a degree, erosion will likely continue after construction is complete; however, standard trail maintenance such as cleaning water bars should mitigate this concern. Trail condition surveys will identify any areas of concern. The erosion that is likely to occur under any of the three alternatives, in combination with effects from past, present, and future activities such as livestock grazing, oil and gas development, and road construction, would not have a significant adverse cumulative effect on the soil and hydrology resources in the analysis area.

Construction of any of the three action alternatives would remove vegetation and expose soil in the creation of the trail tread and stream crossing structures. The recreation section of this chapter identified that the trail tread and stream crossings structures under Alternative H would disturb approximately 10.4 acres, 8.9 acres under Alternative B and 6.3 acres under Alternative E. Each alternative would also disturb approximately 4.4 acres in the construction of the Coal Creek campground and trailheads. All this activity would occur within a project area that contains all of six townships (138,250 acres) and two partial townships (23,040 acres).

As previously noted, trail construction, under any of the action alternatives, will likely generate some erosion. Surface hydrology is typically altered by trails, which can capture runoff and concentrate it in the trail. The construction of foot bridge abutments, low water crossings, campground facilities, and trailheads will likely result some minor erosion. These impacts are temporary in nature and are further mitigated through application of the Soil and Water BMPs, implementation of proper construction techniques such as installation of water bars in the trail, silt fences, graveling parking surfaces and campground pads, re-vegetating disturbed sites, etc.

Bridges that span stream channel and banks would have beneficial effects on stream function or water quality. They would prevent trail users from breaking down banks at crossings resulting in the introduction of sediment into the stream and degradation of water quality. Low water crossings would require disturbance of channel and bank materials, which would have a short-term (one to a few years) impact on water quality during flow events. However, they too would service to reduce or eliminate overall impacts to stream channels and water quality.

Cultural Resources

The National Historic Preservation Act outlines protection measures for heritage resources. Prior to any undertaking, as defined in 36 CFR 800, all heritage resources are located, and, in consultation with the State Historic Preservation Office (SHPO), are evaluated for their potential to be placed on the National Register of Historic Places. Those sites determined to be eligible are identified as “historic properties.” The SHPO and, in some cases, the Advisory Council on Historic Preservation must be informed of potential adverse effects to any historic property. If an adverse effect is determined through consultation with SHPO, an agreement on mitigating the adverse effects must occur through additional consultation with SHPO and the Advisory Council, before any project may take place.

Methodology for Analysis

An archeological survey was completed for the proposed action. The survey covered approximately 43.4 miles. A 150-foot-wide corridor (approximately 787 acres) was surveyed. A prior survey of three segments on private and state land totaling 4.45 miles was inventoried for right of way acquisition (Floodman 2004). The proposed Coal Creek Campground was also surveyed; an area of about 60 acres was inventoried to encompass the campground area. Cultural properties found in the survey are listed in the table below.

Existing Condition

The Dakota Prairie Grasslands exhibits a wide variety of heritage resource types. The types can be considered as prehistoric resources and historic resources. Prehistoric resources (approximately 12,00 to 250 years before present) include trails, tool stone quarries, tipi ring and open camps, stone alignments, rock shelters, bison kills, eagle trapping pits, lodges, and ceremonial sites. Historic resources include trails, camps, and battlefields from the military period (1864-1877), homesteads, trash dumps, bridges, and CCC construction projects/camps.

Site size can vary greatly. Sites can be less than a few feet in diameter and consist of a few stone chips or a few tin cans. Other sites can cover 300 acres or more and contain thousands of artifacts. Sites associated with roads may be several miles long.

Table 3-17. Inventoried cultural properties in the Maah Daah Hey Trail II analysis area.

| Type of Site | Number of Sites | Percent of Total Sites |
|---|-----------------|------------------------|
| Prehistoric | 6 | 46 |
| Historic | 2 | 15 |
| Isolated finds | 5 | 39 |
| Total | 13 | |
| Sites/portions of sites eligible for NRHP | 0 | |
| Non-eligible sites | 7 | 54 |
| Sites lacking information to determine if eligible for NRHP | 6 | 46 |
| Total | 13 | |

Desired Condition

The goal of the heritage resource program is to prohibit disturbance to cultural sites by management activities, vandalism and to insure that all historic properties are preserved in place for the future. All sites that are of undetermined eligibility for the NRHP will be treated as if they were known to be eligible. This is usually accomplished through redesign of project effects to cultural resources, specified protection measures, monitoring and coordination efforts. Historic properties can be interpreted for the education and enjoyment of the public while protecting the integrity of the site. Non-research oriented ground disturbances to heritage districts or eligible properties that create adverse impacts are limited. All human remains will be left undisturbed and in-situ. These measures are outlined in the DPG Plan in Chapter 1 Section N (pp. 24-25).

Environmental Consequences

Mitigation and Monitoring

When a long trail is constructed, it may need minor alignment adjustments. If a route adjustment is outside the 150-foot corridor, it will need to be surveyed and cleared by a Grasslands archeologist before it can be constructed.

Alternative G – No Action

There are no archeological concerns because no trail would be constructed under this alternative.

Alternative H – Proposed Action

Direct and Indirect Effects: The following design criteria were applied during the design for the proposed action. As a result, the Forest Service archeologist indicated that this trail and campground project will represent a position of **no historic properties affected**:

- ◆ The trail was relocated to avoid five prehistoric sites along the proposed route.
- ◆ One prehistoric site, lies outside of the area of effect and did not require trail alteration.
- ◆ Two historic sites and five isolated finds are not eligible to the NRHP and do not require avoidance by trail construction.
- ◆ The survey of the area of the proposed Coal Creek Campground revealed no resources within the area of potential effect.

Cumulative Effects: Through trail design, all known archeological resources were either avoided or are of no consequence thus there are no direct or indirect effects associated with Alternative H. As there are no direct or indirect effects, there are no cumulative effects.

Alternative B

Portions of this alternative are identical to Alternative H. For those sections, there would be no effect to archeological resources. For the other portions of the trail, no field work was conducted. If this alternative were to be selected, an archeological survey would be required for the sections that have not been surveyed and those section cleared by the Forest Service

archeologist before construction could occur. It is standard procedure on the DPG to design trails to avoid any significant archeological sites.

Alternative E

No field work was conducted for this alternative and the exact effects to heritage sites are unknown. If this alternative were to be selected, the route would require an archeological survey and clearance by the Forest Service archeologist before construction could occur. It is standard procedure on the DPG to use avoidance to mitigate any concern tied to significant archeological sites.

Compliance with the DPG Plan and Other Regulatory Direction

All of the alternatives would meet Forest Service Manual direction related to recreation development. They would also meet the Dakota Prairie Grassland Recreation Strategy and Master Plan and help fulfill the National Recreation Strategy. Alternatives B and H would meet applicable DPG Plan direction whereas Alternative E would not meet a key standard for special interest areas (MA 2.1).

MA 2.1 - “Complete site-specific plans for managing the area prior to promoting public visits to a Special Interest Area or making significant changes to its land management” (DPG Plan, p. 3-8). Alternative E travels the length of the Custer Trail/Davis Creek SIA. No management plan has been written for this SIA.

Alternative E would also require a right-of-way (ROW) across private property in either Section 11 or 12, T137N, 101W. The Forest Service contacted both landowners to determine their willingness to grant a permanent ROW across their land. One landowner stated he was 100 percent against it, however, he might consider it if the Forest Service were a 100 percent responsible for fire on private property. The remaining landowner said he would not consider a permanent ROW but might consider an annual ROW. This person also said the Forest Service would have to take on all fire and search and rescue responsibilities.

The Forest Service cannot take responsibility for wildfire or search and rescue on private lands, these are county responsibilities. 40 U.S.C. Section 255 prohibits any use of federal funds on private property without a permanent ROW.

Compliance with the Forest Plan was achieved by redesign of the Maah Daah Hey II trail to avoid five prehistoric cultural sites. These sites are preserved in-situ for future research or for possible interpretation to the public at some point in time. Sites that did not make eligibility requirements were not avoided.

Soil and water resources are protected through adherence to the following standards and guidelines in the DPG Plan:

Table 3-18. Compliance with DPG Plan direction by alternative.

| Standard or Guideline | Alternative G No Action | Alternative H, E, and B |
|--|----------------------------|---|
| 1. Manage land treatments to conserve site moisture and to protect long-term stream, wetland, and riparian area health from damage by increased runoff. Standard | Most Compliant | Short-term impact during trail construction followed by long-term compliance |
| 2. Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions. Standard . | Most Compliant | Short-term impact during trail construction followed by long-term compliance |
| 3. Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem, including quantity and quality of surface and ground water. Standard | Most Compliant | Short-term impact during trail construction followed by long-term compliance |
| 6f. Do not allow new roads to parallel streams when road location must occur in riparian areas except where absolutely necessary. Locate crossings at points of low bank slope and firm surfaces. Guideline | Most Compliant | Short-term impact during trail construction followed by long-term compliance |
| 7. Design and construct all stream crossings and other in-stream structures to provide for sufficient passage of flow and sediment, withstand expected flood flows, and allow free movement of aquatic life. Standard | Most Compliant | Short-term impact during trail construction followed by potentially long-term compliance (depends on the type of stream crossing used); Under all alternatives native fords would be best; bridges would be next best, and low-water crossings would be worst in allowing free movement of aquatic life. Low-water crossings require constant maintenance or they commonly become obstructed with sediment and debris and restrict movement of aquatic species. |
| 8. Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function and meet regulations found in Section 404(b)(1) of the Clean Water Act. The 404 regulations were established by the Environmental Protection Agency and constitute the substantive environmental criteria used in evaluating activities. | Most Compliant | Short-term impact during trail construction followed by long-term compliance |

| Standard or Guideline | Alternative G No Action | Alternative H, E, and B |
|--|----------------------------|--|
| 8c. Design projects to minimize sediment discharge into streams, lakes, and wetlands. | Most Compliant | Short-term impact during trail construction followed by long-term compliance |
| 2. Stabilize and maintain roads and other facilities sites during and after construction to minimize erosion. Standard | Most Compliant | Short-term impact during trail construction followed by long-term compliance |

Irreversible and Irretrievable

Irreversible and irretrievable commitments of resources are defined in Forest Service Handbook 1909.15 (2/21/95).

- ◆ The irreversible commitment of resources means that nonrenewable resources are consumed or destroyed. Examples include mineral extraction, which consumes nonrenewable minerals, and potential destruction of such things as heritage resources by other management activities. These consumptions or destructions are only renewable over extremely long periods of time.
- ◆ The irretrievable commitment of resources are opportunities foregone. They represent trade-offs in the use and management of grassland resources. Irretrievable commitment of resources can include the expenditure of funds, loss of production, or restrictions on resource use.

Recreation: Under all the action alternatives, there is the possibility that some opportunities for solitude and serenity will be lost in the three affected IRAs, which may constitute an irretrievable commitment of a non-tangible resource. The acreage disturbed to construction of the Coal Creek campground, access road, trail tread, and trailheads would be a irretrievable commitment for the life of the trail and campground.

Heritage resources: There are no irreversible or irretrievable commitments by the project to heritage resources.

Wildlife: All action alternatives would result in an insignificant amount of irretrievable commitment of resources. The trail itself will result in the lost productivity of an insignificant amount of land. Coal Creek Campground and trail heads will result in the temporary loss of productivity of approximately 10 acres within the analysis area. Since bighorn sheep key areas and known raptor nests are avoided, there will be no risk of abandonment of these areas (no irretrievable commitment). There are not expected to be any irreversible commitment of resources associated with any of the alternatives.

References

- Allen, George. 1986. Prairie falcon aerie summary. North Dakota State University. Fargo, ND.
- American Hiking Society. 2002. The economic benefits of trails. Silver Spring, MD.
www.Americanhiking.org
- BASF. 2006. www.vmanswers.com
- Baydack, R.C. and D.E. Hein. 1987. Tolerance of sharp-tailed grouse to lek disturbance. *Wildl. Soc. Bull.* 15:535-539.
- Benninger, M. 1989. Trails as conduits of movement for plant species in coniferous forests of Rocky Mountain National Park, Colorado. Masters thesis. Miami University. Oxford, Ohio.
- Benninger-Truax, M., J. Vankat, and R. Schaefer. 1992. Trail corridors as habitat and conduits for movement of plant species in Rocky Mountain National Park, Colorado. *Landscape Ecology.* 6(4):269-278.
- Bismarck Tribune. 1999. Outdoors section. February 21, 1999.
- Bosworth, Dale. 2004. USDA Forest Service Chief. Four threats to the health of the Nation's forests and grasslands. <http://www.fs.fed.us/projects/four-threats/>
- Carpinelli, Michael. 2006. USDA-Agricultural Research Station, Burns, OR.
<http://www.nps.gov/plants/alien/fact/cebi1.htm>
- City of Boulder. 2005. City of Boulder open space and mountain parks visitor master plan. pp. 141.
- Clements, D., J. Young, and K. Gray. 2005. Cheatgrass and mule deer habitat. Proceedings of the 6th Western States and Provinces Deer and Elk Workshop. Reno, NV. 6:20.
- Clinton, William. 2001. Executive Order 13186 -- Responsibilities of federal agencies to protect migratory birds.
- Cole, David. 1981. Vegetational changes associated with recreational use and fire suppression in the Eagle Cap Wilderness, Oregon: some management implications. *Biological Conservation.* 20:247-270.
- Coyle, Ann. 2006. Golden Eagle Report: #USFSMHT-03-15-2006. Spreadsheet included separately.
- Dale, D. and T. Weaver. 1974. Trampling effects on vegetation of the trail corridors of north Rocky Mountain Forests. *Journal of Applied Ecology.* 11:767-772.
- Dawson, J.O., P.N. Hinz, and J.C. Gordon. 1974. Hiking trail impact on Iowa stream valley forest preserves. *Iowa State Research Journal.* 48:329-337.
- Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman, and B. R. Euliss. 1998a (revised 2001). Effects of management practices on grassland birds: Sprague's pipit. Northern Prairie Wildlife Research Center, Jamestown, ND. 15 pages.
-

- Dechant, J.A., M.L. Sondreal, D.H. Johnson, L. D. Igl, C.M. Goldade, M.P. Nenneman, and B. R. Euliss. 1998b (revised 2002). Effects of management practices on grassland birds: Baird's sparrow. Northern Prairie Wildlife Research Center, Jamestown, ND. 19 pages.
- Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, P.A. Rabie, and B.R. Euliss. 1999 (revised 2002). Effects of management practices on grassland birds: long-billed curlew. Northern Prairie Wildlife Research Center, Jamestown, ND. 19 pages.
- Demarchi, R.A., C.L. Hartwig, and D.A. Demarchi. 2000. Status of the Rocky Mountain bighorn sheep in British Columbia. BC Minist. Envirn., Lands and Parks, Wildl. Branch, Victoria, BC. Wildl. Bull. No. B-99.
- Eraas, Ken. 2006. Noxious Weed Specialist. North Dakota Department of Agriculture. Telephone Conversation during June, 2006. 701-328-2980.
- Executive Order 13112. 1999. Invasive species. Federal Register: Volume 64, Number 25. <http://www.invasivespeciesinfo.gov/laws/execorder.shtml>
- Feist, Jerry. 1997. Bighorn sheep (*Ovis canadensis*) ecology and demography in the North Dakota Badlands. M.S. Thesis, University of North Dakota. Grand Forks, ND.
- Gelbard, J. and J. Belnap. 2003. Roads as conduits for exotic plant invasions in a semiarid landscape. *Conservation Biology*. 17:420-432.
- Glasoe, Curt. June 7, 2006. E-mail message giving information related to trail use along northern portion of MDH trail.
- Hall, Dennis. 1997. A deeper ecology of trails. Trail Tracks Newsletter of the American Trails organization. <http://www.americantrails.org/trailtracks/Summer97TT/TwoViewsWildA.html>
- Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, WA.
- Holl, Steve. 2004. Implementation strategy to restore the San Gabriel Mountains bighorn sheep population. California Department of Fish and Game, Los Angeles County Fish and Game Commission; and the USDA Forest Service.
- Idaho State Department of Agriculture. 1999. Idaho's strategic plan for managing noxious and invasive weeds. <http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/indexnoxweedmain.php>
- Jordan, Marilyn. 2000. Ecological impacts of recreational use of trails: a literature review. Unpublished Report, The Nature Conservancy, Cold Spring Harbor, NY.
- Joslin, G. and H. Youmans. coordinators 1999. Effects of recreation on Rocky Mountain wildlife: a review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society. 307pp.
- Lonsdale, W.M. 1999. Global patterns of plant invasions and the concept of invisibility. *Ecology*. 80:1522-1536.
- Kimbell, Abigail. 2004. Forest Service Northern Region sensitive species list.
-

-
- Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. Golden eagle (*Aquila chrysaetos*). In *The Birds of North America*, No. 684 (A. Poole and F. Gill, eds.). The Birds of North America, Inc. Philadelphia, PA.
- Kocis S.M., D.B.K. English, S.J. Zarnoch, R. Arnold, and L. Warren. 2003., National visitor use monitoring results. USDA Forest Service, Region 1, Dakota Prairie Grasslands.
- Marcus, W.A., A.G. Milner, and B. Maxwell. 1998. Spotted knapweed distribution in stock camps and trails of the Selway-Bitterroot wilderness. *Great Basin Naturalist*. 58:156-166.
- McGregor, R.L., T.M. Barkley, R.E. Brooks, and E.K. Schofield. 1986. *Flora of the Great Plains*. Great Plains Flora Association. University Press of Kansas. Lawrence, KS.
- Nicholoff, S.H., compiler. 2003. Wyoming Bird Conservation Plan, Version 2.0. Wyoming Partners In Flight. Wyoming Game and Fish Department, Lander, WY.
(<http://www.blm.gov/wildlife/plan/WY/Wyoming%20Bird%20Conservation%20Plan.htm>)
- North Dakota Department of Health, Division of Water Quality, 2004. North Dakota 2004 integrated section 305(b) water quality assessment report and section 303(d) list of waters needing total maximum daily loads, 131 p.
- North Dakota Game and Fish Department. 2004. Image (.jpg) of telemetry locations for collared bighorn sheep in the southern meta-population.
- North Dakota Game and Fish Department. 2002. Bighorn sheep PAMA update.
- Oregon Department of Agriculture. 2002. Noxious weed strategic plan.
<http://www.doc.state.or.us/ODA/PLANT/docs/pdf/one.pdf>
- Parker, I.M., S.K. Mertens, and D.W. Schemske. 1993. Distribution of seven native and two exotic plants in a tallgrass prairie in southeastern Wisconsin: The importance of human disturbance. *American Midland Naturalist*. 130:43-55.
- Personnel communication with Mike Nass, Bureau of Land Management. 2006. Topic: Potential effect of H₂S gas on trail users for the proposed MDH II Trail.
- Pokorny, Tami. 1996. Getting a grip on weeds. National Outdoor Leadership School. Viewed on the Leave No Trace web page.
(<http://archive.Pokorney.org/POKORNEYPublications/Newsletter/Weeds.php>)
- Potito, A. and S. Beatty. 2005. Impacts of recreation trails on exotic and ruderal species distribution in grassland areas along the Colorado Front Range. *Environmental Management*. 36:230-236.
- Rinehart, S. and A. Zimmerman. 2001. The bullseye study. USDA Forest Service – Medora Ranger District. Unpublished internal document.
- Royer, Ron. 2004. Final report to the Dakota Prairie Grasslands: on the status of five sensitive butterfly species within the Medora District pastures in the vicinity of Whitetail Picnic Area, Square Butte and Moody Plateau in the Little Missouri National Grassland, North Dakota. August 10, 2004. pp. 24.
- Royer, Ron. 2003. *Butterflies of North Dakota: an atlas and guide*. Science Monograph Number Two. Minot State University. 192 pp.
-

- Sayre, Roger. 1996. Ecology of bighorn sheep in relation to habitat and oil development in the Little Missouri Badlands. Ph.D. Dissertation, University of North Dakota. Grand Forks, ND.
- Scherer, Glen. 2001. We have met the enemy and he is us. American Hiker. March/April 2001. www.northcountrytrail.org/news/impact1.htm
- Sheley, Roger, B. Olson, and C. Hoopes. 2005. What is so dangerous about the impact of noxious weeds on Montana's ecology and economy? Montana Statewide Noxious Weed Awareness and Education Campaign. <http://www.weedawareness.org/impacts.html>
- Sprung, Gary. 1997. A new scourge on the landscape? Trail Tracks Newsletter of the American Trails organization. <http://www.americantrails.org/trailtracks/Summer97TT/TwoViewsWildA.html>
- Stynes, Daniel J. and E.M. White. 2005. Spending profiles of National Forest visitors, NVUM four year report. On file in the project record.
- Sweanor, P.Y., M. Gudorf, F.J. Singer, R. Andrascik, W.F. Jensen, C.W. McCarty, M. Miller, D. Reed, and R. Schiller. 1994. Bighorn sheep habitat assessment of the Greater Theodore Roosevelt National Park area. National Park and National Biological Survey cooperative report. Theodore Roosevelt National Park, Medora, ND. 55 pp.
- Tinsley, Bradford and E. Fish. 1985. Evaluation of trail erosion in Guadalupe Mountains National Park, Texas. Landscape Planning. 12: 29-47.
- USDA Forest Service. 2006. Draft environmental impact statement. noxious weed management project. Dakota Prairie Grasslands.
- USDA Forest Service. 2004. National strategy and implementation plan for invasive species management. FS-805.
- USDA Forest Service. 2001a. Final environmental impact statement for the Northern Great Plains management plan revisions, May 2001. United States Department of Agriculture, Forest Service, Northern Region, Missoula, MT.
- USDA Forest Service. 2001b. Land and resource management plan for the Dakota Prairie Grasslands. United States Department of Agriculture, Forest Service, Northern Region, Missoula, MT.
- USDA Forest Service. 2001c. Guide to noxious weed prevention practices.
- USDA Forest Service. 1995. Forest Service Manual 2672.1.
- USDA Natural Resources Conservation Service, 2004. Soil survey geographic (SSURGO) database for Golden Valley and Billings County, North Dakota, Fort Worth Texas. <http://SoilDataMart.nrcs.usda.gov/>
- USDI Bureau of Land Management. 2001. Status of the science: on questions that relate to BLM Plan amendment decisions and peninsular ranges bighorn sheep.
- USDI Bureau of Land Management. 2000. Recreation management guidelines to meet public land health standards on Bureau of Land Management lands in Colorado. www.co.blm.gov/rguideline/guide_final.htm
- USDI Bureau of Land Management. Unkn. BLM Wyoming wildlife plan and recommendations.
-

-
- USDI Fish and Wildlife Service. 1995. North Dakota's federally listed endangered, threatened, and candidate species - 1995. U.S. Fish and Wildlife Service, Bismarck, ND. Jamestown, ND: Northern Prairie Wildlife Research Center Online.
<http://www.npwrc.usgs.gov/resource/wildlife/nddanger/nddanger.htm> (Version 16JUL97).
- USDI Fish and Wildlife Service. 2005a. North Dakota Field Office website:
http://northdakotafieldoffice.fws.gov/endspecies/endangered_species.htm (Version 13JUL2005).
- Warm, Arden. March 2, 2004. Meeting documentation between Warm and Brett Weidmann over original trail location.
- Warm, Arden. May 25, 2006. E-mail message documenting meeting between Warm and Brett Weidmann.
- Washington, J. and C. Gildar. 2004. Analysis of thirty-five oil and gas well pad reclamation sites on the Medora and McKenzie Ranger Districts. Unpublished wildlife/botany program report. USDA Forest Service, Little Missouri National Grassland, Dickinson, ND.
- Weidmann, Brett. June 19, 2006. Presentation to the Medora RD personnel on North Dakota's bighorn sheep.
- Wilderness Institute. 2005. Wilderness monitoring. College of Forestry & Conservation, University of Montana, Missoula, MT.
http://www.forestry.umt.edu/research/mfces/programs/wi/Monitoring1_2005.htm
- Williams, B. and L. Conway-Durver. 1998. Horse trails in ecological reserves. National Symposium on Horse Trails in Forest Ecosystems. Clemson University, S.C.
- Whittaker, P.L. 1978. Comparison of surface impact by hiking and horseback riding in the Great Smokey Mountains National Park. Management Report 24, 32 pp. USDI, National Park Service. Southeast Region.
- Young, James and D. Clements. 2006. Historic cheatgrass fueled wildfires in Nevada. Nevada Wildland Fire Research and Outreach Conference, Reno, NV.
http://www.ars.usda.gov/research/publications/publications.htm?seq_no_115=194136.
- Young, James and D. Clements. 2004. Cheatgrass. Cabi Croip Protection Compendium Datasheet: Invasive Plants, Text section. P. 1-19.
- USDA Forest Service. 2003. Dakota Prairie Grasslands recreation strategy and master plan.
- USDA Forest Service. 2002. Dakota Prairie Grasslands Land and Resource Management Plan and the associated Record of Decision. USDA Forest Service, Northern Region.
- USDA Forest Service. 2001. Northern Great Plains final environmental impact statement. USDA Forest Service, Northern Region.
- USDA Forest Service Handbook 1909.12, Chapter 7.
- USDA Forest Service Manual 2300.
-

CHAPTER 4

CONSULTATION AND COORDINATION

Preparers and Contributors

The following Forest Service employees and agencies contributed to this environmental assessment:

Forest Service Preparers and Contributors:

Core Interdisciplinary Team Members

| | | |
|-----------------|--|--------------------------------------|
| Jeff Adams | National Environmental Policy Act Specialist | Medora Ranger District, DPG |
| Jennifer Berger | Recreation Specialist/ Team Leader | Juneau Ranger District, Tongass N.F. |
| Mervin Floodman | Archeologist | McKenzie Ranger District, DPG |
| Leslie Horsch | Writer/Editor | Bighorn National Forest |
| Phil Sjurson | GIS Coordinator | DPG Supervisors Office, DPG |
| Tina Thornton | Reality Specialist | Medora Ranger District, DPG |
| Russ Walsh | Trails Coordinator | Medora Ranger District, DPG |
| Arden Warm | Wildlife Biologist | Medora Ranger District, DPG |
| Joe Washington | Botanist | Medora Ranger District, DPG |

Support Interdisciplinary Team Members

| | | |
|---------------|--------------------|-----------------------------|
| Curt Glasoe | Engineer | DPG Supervisors Office |
| Josh Wilke | Mineral Specialist | Medora Ranger District, DPG |
| Dean Williams | Range Specialist | Medora Ranger District, DPG |

State and Federal Agencies

| | | |
|----------------|---|----------------------------|
| Mike Nash | Mineral Resources, Assistant Field Office Manager | Bureau of Land Management |
| Brett Wiedmann | Big Horn Sheep Biologist | North Dakota Game and Fish |

This environmental analysis (EA) has been distributed to agencies, organizations, and individuals who provided comments during the scoping process and to individuals or organizations who specifically requested a copy of the document. A legal notice requesting comment on this EA was published in the DPG official paper of record, The Bismarck Tribune, and the DEIS was made available on the Internet to any interested party.
