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Draft Environmental Impact Statement

Black Hills National Forest Travel Management Plan

Black Hills National Forest
Custer, South Dakota

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Black Hills National Forest Travel Management Plan
Draft Environmental Impact Statement

Custer, Fall River, Lawrence, Meade and Pennington Counties, South Dakota and Crook and Weston Counties, Wyoming

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Abstract: This draft environmental impact statement (DEIS) documents the analysis of five alternatives to manage motorized vehicle travel on the Black Hills National Forest (the Forest). This DEIS was prepared following extensive public comment including collaboration with the National Forest Advisory Board, scoping, several open houses, and public meetings and workshops. Alternative A, no action, proposes a continuation of the current condition. Alternative B, the modified proposed action, would develop a motorized recreational system, while considering effects to natural and cultural resources. It would allow public motorized vehicle travel on 4,129 miles of routes, and limited motorized cross-country travel for game retrieval and dispersed camping on 179,000 acres. Alternative C would maximize motorized road and trail use. It would allow motor vehicle travel on 4,353 miles of routes, and limited motorized cross-country travel for game retrieval and dispersed camping on 473,500 acres. Alternative D would provide a smaller motorized transportation system with fewer motorized trails. It would allow public motorized vehicle travel on 3,197 miles of routes and prohibit motorized cross-country travel. Alternative E represents the minimum action required to designate a motorized travel system and comply with the Travel Management Rule. It would allow motorized vehicle travel on 3,776 miles of routes and prohibit motorized cross-country travel. At this time, the Forest Service has not identified a preferred alternative.

It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the EIS. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. The submission of timely and specific comments can affect a reviewer's ability to participate in subsequent administrative review or judicial review. Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered; however, anonymous comments will not provide the respondent with standing to participate in subsequent administrative or judicial reviews.

Send Comments to:	**BHNF Travel Mgmt Plan DEIS** **P.O. Box 162909** **Sacramento, CA 95816-2909** **E-mail to: BHNFcomments@fscomments.org** **Fax to: 916-456-6724**
Date Comments Must Be Received:	**May 4, 2009**

Commonly Used Acronyms and Abbreviations

ATV – All-Terrain Vehicle
BMP – Best Management Practice
CEQ – Council on Environmental Quality
CFR – Code of Federal Regulations
CMUA – Concentrated Motorized Use Area
CWA – Clean Water Act
DBH – Diameter at Breast Height
DEIS – Draft Environmental Impact Statement
EIS – Environmental Impact Statement
EPA – Environmental Protection Agency
FEIS – Final Environmental Impact Statement
FS – Forest Service
FSH – Forest Service Handbook
FSM – Forest Service Manual
GIS – Geographic Information System
HRV – Historic Range of Variability
ID Team – Interdisciplinary Team
LMP – Land Management Plan (Forest Plan)
MIS – Management Indicator Species
MVUM – Motor Vehicle Use Map
NEPA – National Environmental Policy Act
NFAB – National Forest Advisory Board
NFMA – National Forest Management Act
NFS – National Forest System
NRCS – Natural Resource Conservation Service
NVUM – National Visitor Use Monitoring
NWI – National Wetlands Inventory
ORV – Off-road Vehicle
OHV – Off-highway Vehicle
R2 – Region 2 (Rocky Mountain Region) of the Forest Service
RMBO – Rocky Mountain Bird Observatory
ROS – Recreation Opportunity Spectrum
SHPO – State Historic Preservation Office
SIO – Scenic Integrity Objectives
SOLC – Species of Local Concern
USC – United States Code
USDA – United States Department of Agriculture
USDI – United States Department of the Interior
UTV – Utility Terrain Vehicle
WCPH – Watershed Conservation Practices Handbook
WIZ – Water Influence Zone

Summary

In November 2005, the Forest Service issued the final Travel Management Rule (the Rule, or travel management rule - Federal Register, 70FR68264). This Rule specifically requires that any roads, trails, and areas that are to be open to motor vehicle use on a National Forest be officially designated. The Rule also directs that designations be made by class of vehicle and by season of use, where appropriate and necessary. Motor vehicle use would be prohibited on routes and areas not designated open to use.

To comply with the Rule, the Forest Service proposes to designate certain roads and trails open to motorized travel on the Black Hills National Forest. Class of vehicle and season would be assigned to the designated roads or trails. Motorized travel, as allowed on designated routes and areas, would be depicted on a motor vehicle use map (MVUM). The motor vehicle use map would be the primary tool used to determine compliance and enforcement of motorized vehicle use on the ground. Existing Forest Service system routes and other routes not designated on the motor vehicle use map would be legally closed to motorized travel.

The designated route system would reflect current and anticipated travel needs, offer a variety of recreational opportunities, and provide for administrative access, while balancing the physical, biological, and social attributes of the Forest. The area affected by the proposal includes roughly 1.2 million acres of National Forest System (NFS) lands managed by the Black Hills National Forest, within the proclaimed Forest boundary. The decisions on motorized travel would not include snowmobiles or existing winter-use recreation or South Dakota snowmobile trails.

This action is needed to:

- Identify an official travel system and update the Forest travel map;
- Develop a transportation system to meet the increasing demand for recreational travel opportunities and to provide a range of quality experiences for a wide variety of Forest users;
- Reduce adverse impacts caused by unmanaged cross-country and road and trail usage in order to maintain and conserve the condition of ecosystems and watersheds;
- Specify roads, trails and areas open to motorized use; and,
- Closely align travel and recreation opportunities offered to the public with the Forest's management capability.

Based upon the analysis of the effects of the alternatives as disclosed in the final EIS and in the project record, the Forest Supervisor as the responsible official would make the following decisions.

- Whether to designate certain routes, trailheads and other facilities as open to the public for motorized use.
- Whether to authorize improvements to certain routes to allow their use, and if so, the nature of those improvements.
- Whether to allow motorized game retrieval and motorized dispersed camping or off-road parking.
- The season or types of public motorized use allowed for those routes open to motorized travel.
- Whether to amend existing Forest Plan direction to allow implementation of the selected travel management alternative.

To develop this proposal, the Forest worked closely with the National Forest Advisory Board (NFAB), which developed a number of recommendations for a motorized travel system. The Forest also consulted

many user groups and individuals via public meetings and workshops, and questionnaires. During the scoping process, the Forest received comments on the proposed action from the public, Indian tribes and State and Federal agencies. The Forest evaluated these comments and developed four issue statements to guide development of alternatives to the proposed action. The significant issues used to develop alternatives and analyze effects are:

1) effects on natural and cultural resource effects;
2) effects on recreational opportunities;
3) effects of transportation system design on management capabilities; and
4) social and economic concerns.

These issues led the agency to develop the following range of alternatives.

Alternative A - No Action. Alternative A would continue the current situation. Current management plans would continue to guide project area management. Cross-country motorized use would continue on 864,000 acres in an unregulated manner. The official motorized trail system would consist of the existing 36 miles of trails. No motor vehicle use map would be issued. User compliance and law enforcement would continue to be difficult without an approved motor vehicle use map. It is expected that motorized cross-country travel and route proliferation would continue to occur in areas of the Forest. Resource damage and conflicts with nonmotorized recreationists would continue to take place, and motorized users would not enjoy a planned travel system designed to meet their needs.

Action Alternatives. Alternatives B, C, D, and E would comply with the Travel Management Rule and meet the purpose and need to designate selected roads and trails open to motorized vehicle travel on lands administered by the Forest. Designations would be made by class of vehicle and by season. A motor vehicle use map would be published depicting designated roads and trails. All of these alternatives would amend the Forest Plan to allow motorized use levels and to specify that motorized use must be conducted in compliance with the motor vehicle use map.

A major consideration in this analysis is motorized-mixed use, or the use of both highway-legal and non-highway-legal motor vehicles on NFS roads. Alternatives B, C and D would pre-empt (not be in accord with) South Dakota State law, which currently requires that only highway-legal motor vehicles may use public roads. Alternatives B, C and D would comply with Wyoming State law by enrolling all designated roads in the Wyoming Off-Road Recreational Vehicle program. All alternatives would be consistent with laws in both states requiring licensing of vehicle operators.

Alternative B – Modified Proposed Action. Alternative B represents the original proposed action. It has been modified to correct data errors, but the intent of this alternative is the same as the original proposed action on which the public was asked to comment. This alternative would meet most NFAB recommendations to provide an active (designed) travel system while protecting resources and reducing conflicts with other users. It would provide 3,466 miles of roads including 2,226 miles of motorized-mixed-use roads; boost motorized trails to 663 miles; and limit cross-country motorized use to 179,000 acres only for the purposes of game retrieval (elk only) or dispersed camping. The motor vehicle use map would make user compliance and law enforcement easier. Resource damage and conflicts with nonmotorized recreationists would be reduced, and motorized users would find a planned travel system designed to meet their needs.

Alternative C. Alternative C would provide the largest motorized travel system. It would provide 3,582 miles of roads including 2,878 miles of motorized-mixed-use roads; boost motorized trails to 771 miles; and limit cross-country motorized use to 473,500 acres only for the purposes of game retrieval (elk and deer) or dispersed camping. The motor vehicle use map would make user

compliance and law enforcement easier. Higher user numbers could bring more business to adjacent communities, and motorized users would find a planned travel system designed to meet their needs.

Alternative D. Alternative D would provide the smallest motorized travel system. It would reduce impacts of motorized travel on natural and cultural resources, reduce conflicts with nonmotorized recreationists, and would promote a safer environment for motorized users. It would provide 2,877 miles of roads including 580 miles of motorized-mixed-use roads; and 320 miles of motorized trails, and prohibit motorized cross-country use for any reason, with exceptions. The motor vehicle use map would make user compliance and law enforcement easier. Resource damage, conflicts with nonmotorized recreationists and system maintenance costs would be reduced, and motorized users would find a planned travel system designed to meet their needs.

Alternative E. Alternative E would take the minimum actions necessary to comply with the Travel Management Rule. It would provide a motor vehicle use map designating the existing travel system. Alternative E would provide 3,740 miles of roads including 160 miles of motorized-mixed-use roads; and 36 miles of motorized trails. It would prohibit motorized cross-country use for any purpose, with exceptions. The motor vehicle use map would make user compliance and law enforcement easier. Resource damage, conflicts with nonmotorized recreationists and maintenance costs would be reduced. Motorized users would find a minimal planned travel system designed to meet their needs.

Major Conclusions

Concerning effects of the alternatives on natural and cultural resources (Issue 1), all action alternatives would reduce current levels of effects from motorized use. All action alternatives would reduce the miles of motorized routes in several important habitats and across the Forest, would limit or prohibit motorized cross-country use, and would reduce the number of points at which motorized routes cross streams and wetlands. These reductions would improve habitat conditions for a variety of species of plants and wildlife. Alternatives D and E would generally present the most improvements in habitat conditions, followed by Alternatives B and C.

Concerning recreation opportunity (Issue 2), route miles available to drivers of highway-legal machines on trails and mixed-use roads would be greatest under Alternative C, followed by Alternatives B and D. Alternatives A and E would offer much less route mileage for drivers of both highway-legal and non-highway-legal machines. Mileage available to unlicensed drivers (on trails only) would be greatest under Alternative C, followed by Alternatives B, D, and E. Motorized cross-country use for any purpose would be available only under Alternative A. Limited motorized cross-country use for game retrieval or dispersed camping would be offered under Alternatives B and C; such use would be prohibited under Alternatives D and E.

Regarding effects on management capabilities (Issue 3), motorized travel use would be more easily enforced under any of the action alternatives than under Alternative A because a motor vehicle use map would be issued. Users not in compliance with the motor vehicle use map could be cited. Considering the total miles of trails, number of trailheads and miles of roads that could be closed, Alternatives C and B would be most costly to implement, in that order, followed by Alternative D. Alternative A would have the highest maintenance costs, followed by Alternatives C, B, D, and E.

Regarding social and economic concerns (Issue 4), Alternatives B and C would offer the highest number of trailheads within 3 miles of communities, which could induce more user-related business in those communities. Alternative D would have the lowest potential for disturbance from noise and dust from motorized use near private lands. The population in the Black Hills region would continue to grow under all alternatives, as would recreational use of the Forest. Forest visitors will continue to expect diverse

recreational opportunities. The reduction or loss of opportunity for motorized cross-country use would be partially offset by the enhanced OHV trail system opportunities under Alternatives C, B, and D, in that order. Private recreational opportunities could be developed to provide other opportunities, but none of the alternatives would be expected to create any measurable social or economic effects in the Black Hills region.

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Chapter 1. Purpose and Need for Action

Document Structure

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

- **Chapter 1. Purpose and Need for Action:** The chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving the purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Chapter 2. Alternatives, including the Proposed Action:** This chapter provides a more detailed description of the agency's proposed action as well as alternatives designed to resolve issues and achieve the stated purpose. These alternatives were developed based on significant issues raised internally, by the public and by other agencies. This discussion also includes design criteria. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- **Chapter 3. Affected Environment and Environmental Consequences:** This chapter describes the expected environmental effects of implementing the proposed action and alternatives. This analysis is organized by resource area (such as wildlife and soils).
- **Chapter 4. Consultation and Coordination:** 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 presented in the environmental impact statement.
- **Index:** The index provides page numbers by document topic.

Additional documentation, including completed specialist reports, scientific and other sources underlying the analysis, and other planning documents, may be found in the project planning record located at the Forest Supervisor's Office in Custer, South Dakota.

Location

The project area consists of Federal lands managed by the Black Hills National Forest, comprising approximately 1.2 million acres in western South Dakota and eastern Wyoming (Figure 1). The bulk of the Forest is located in a contiguous block in western South Dakota, with parcels in eastern Wyoming, including the Bear Lodge Mountains. The gross area within the administrative boundary of the Forest depicted in Figure 1 is 1.5 million acres. Approximately 300,000 acres of lands of other ownerships lie within the Black Hills, and are seen in Figure 1 as white inclusions in the gray background. A small amount of this is in federal ownership (just under 2,600 acres comprise Jewel Cave and Mount Rushmore National Monuments, and the Bureau of Land Management manages lands around Lead and Deadwood), but most is in State or private ownership. Most of the lands on the periphery of the Forest are also non-federal land and privately owned. Much of the private land on the periphery of the Forest and within the Forest is prized for private subdivision development, private recreational ranches, and land speculation whose end purpose is generally residential development. Wildland-urban interface

(WUI) issues played a prominent role in developing current Forest Plan direction and are a prime consideration in management of the Forest.

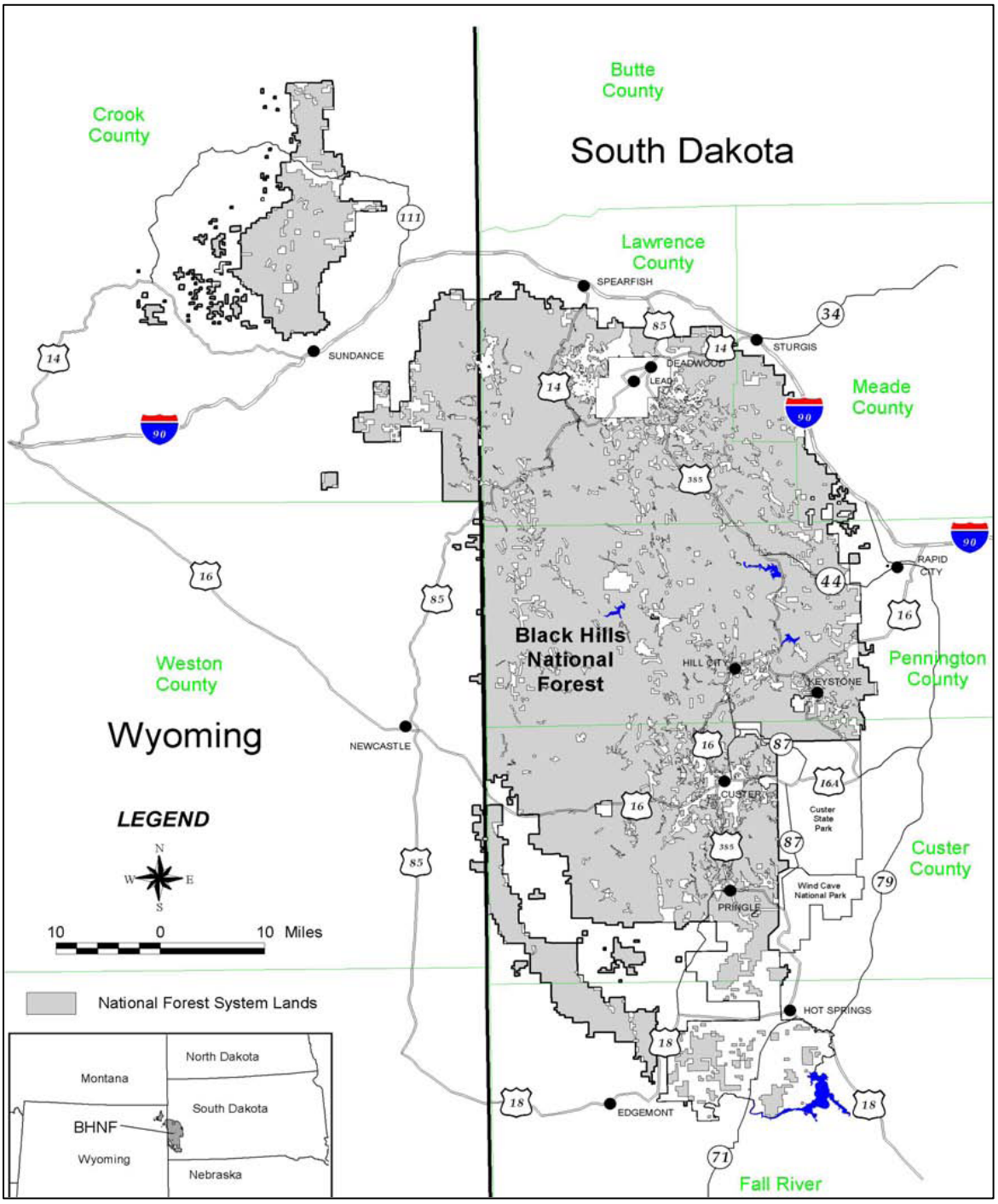

Figure 1. Black Hills National Forest planning area (Source: USDA Forest Service 2004)

Background

The Black Hills National Forest is part of the 191 million acres managed for multiple uses within the National Forest System (NFS). Motorized vehicles are used on NFS lands for a variety of purposes, including access to private property, harvesting timber and herding cattle, accessing recreational opportunities such as hunting, fishing, and camping, for sport and simply driving for pleasure. Nearly everyone who uses NFS lands – even those seeking nonmotorized pursuits – uses motorized vehicles in some fashion.

There are many types of motorized vehicles operating on NFS lands. These include highway-legal sedans, four-wheel-drive vehicles (4x4s), pickup trucks, and off-highway vehicles (OHVs) including all-terrain vehicles (ATVs), "dirt bike" motorcycles, and specialized vehicles such as rock crawlers. OHV use has become particularly popular in the last few decades. Nationally, OHV owners and users have increased in numbers from about 5 million in 1972 to 51 million in 2004. OHV users account for 11 million visitors annually to the National Forests and Grasslands (USDA Forest Service 2004b). The West (including Wyoming) and the Midwest (including South Dakota) as regions rank first and second, respectively, in percentage of residents participating in OHV activities. The states of Wyoming and South Dakota rank second- and seventh-highest in the nation, respectively, in percentage of residents participating in OHV recreation (USDA Forest Service 2005c).

Management of OHV and other motorized uses currently varies throughout the National Forests and Grasslands nationwide. Many Forests and Grasslands restrict motorized vehicle use to designated routes and areas. This approach has been referred to as "closed unless designated open". Conversely, some Forests allow for unrestricted cross-country use and travel on routes that are not part of the regular transportation system. This approach has been referred to as "open unless designated closed". Roads and trails that are not part of the official transportation system are often referred to as non-system or unauthorized routes. This varying regulatory approach for motorized vehicle use across the many National Forests and Grasslands has lead to confusion among users, especially in areas where different Forests border one another. What is legal on one side of the boundary may be illegal on the other side.

The use of motorized vehicles on National Forests and Grasslands provides users with much enjoyment and varied recreational opportunities. There are issues, however, associated with motorized use. Unmanaged motor vehicle use can negatively affect riparian areas, wildlife habitat, soils, vegetation, cultural resources, and historic sites, and can contribute to the spread of invasive weed species. Such use can also bring about conflicts with other users of the National Forests and Grasslands, and adjacent private landowners, and can generate costs associated with route maintenance and law enforcement. In response to these issues, the Chief of the Forest Service in 2004 identified unmanaged recreation (including unmanaged motorized vehicle use) as one of four threats to the health of the nation's forests and grasslands (USDA Forest Service 2004b).

Travel Management Rule

Heightened concern with the effects of unmanaged recreation was followed in November 2005 by the issuance of a new Travel Management Rule (the Rule, or travel management rule -- Federal Register, 70FR68264, incorporated here by reference). The final Rule amended regulations at 36 CFR 212, 251 and 261, and removed obsolete direction at 36 CFR 295. This Rule specifically requires the designation of any roads, trails, and areas that are to be open to motor vehicle use on a National Forest. The Rule also directs that designations be made by class

of vehicle and by season of use, where appropriate and necessary. Motor vehicle use would be prohibited on routes and areas not designated open to use. The Rule provides the motivation for this travel planning effort. It is a major reason why this EIS is being prepared, and it is the reason why the Forest is proposing to designate routes open to use in contrast to the approach used previously.

Presently, most (864,000 acres) of the Black Hills National Forest (the Forest) is open to cross-country motorized travel, and has been for many years. There are over 10,000 miles of authorized roads and trails, unauthorized routes, and other-jurisdiction routes on the Forest. The authorized roads are referred to as system roads. They have been constructed and are maintained to provide administrative and public access to the Forest. System roads are considered necessary for the proper management of the Forest. Some of these system roads are high-speed gravel or paved routes, but most are lower-standard "dirt" roads with native surface material. Many are open on a year-round basis; others are restricted seasonally, typically being closed in the winter and early spring to provide undisturbed wildlife winter habitat and to protect the roadbeds during wet periods.

Definitions (36 CFR 212.1)

Road – A motor vehicle route over 50 inches wide, unless identified and managed as a trail.

Trail – A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail.

Forest road or trail – A road or trail wholly or partially within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources

Unauthorized Route – A route that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas.

Unauthorized roads and trails include a variety of routes. Some are old routes that were either constructed or used for forest management activities on a temporary basis. Users adopted these routes over time and have used them, in some cases for decades. Other routes are user-created. These routes were developed by repeated driving cross-country on the same path winding through the trees or across openings. User-created routes have not been designed by engineers and are sometimes situated in poor locations on the landscape. Other-jurisdiction roads include State highways, county and private roads.

This environmental impact statement (EIS) addresses roads, trails, and areas under jurisdiction of the Black Hills National Forest. This document does not address the management of routes by other jurisdictions. This document does not address travel by over-the-snow machines. This EIS responds to the Travel Management Rule and discloses the effects of five alternative approaches to managing motorized vehicles on the Forest. These alternatives were developed after significant public involvement. The EIS considers which routes should be designated as open to motorized use, what types (class) of vehicles should be used on various routes, which routes should be open yearlong and which ones seasonally, and whether limited cross-country motorized travel should be allowed for purposes of retrieving downed game and/or dispersed camping.

Legal Framework

The Forest Service must comply with numerous laws, regulations, and policies in managing NFS lands. Some of the more important of these relating to travel management planning and implementation are as follows.

Multiple Use-Sustained Yield Act of 1960 (16 U.S.C. 528) – This law states that it is the policy of Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes, and authorizes and directs the Secretary of Agriculture "to develop and administer the renewable surface resources of the National Forests for the multiple use and sustained yield of the products and services obtained therefrom."

National Forest Management Act of 1976 (NFMA; 16 U.S.C. 1600) – The National Forest Management Act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statute governing the administration of National Forests. This law primarily guides the development of Forest Plans, but requires also that project decisions such as will be made under this Forest Travel Management Plan EIS must be consistent with direction in the Revised Forest Plan for the Black Hills National Forest, as amended.

National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321) – This law directs all federal agencies to consider and report the potential environmental impacts of proposed federal actions, and established the Council on Environmental Quality (CEQ). The CEQ regulations implementing NEPA are located at 40 CFR 1500-1508.

36 CFR 212, 251, 261 – Regulations at Part 212 establish requirements for the administration of the forest transportation system, including roads, trails, and airfields, and provisions for acquisition of rights-of-way. These regulations describe a minimum road system and require a science-based roads analysis to plan the road system and to set funding priorities. Regulations at Part 261 establish prohibitions on National Forest System roads that are enforceable by the Forest Service and other federal law enforcement official(s). Collectively, regulations at these three parts govern motorized travel management, land uses, and prohibitions. These were recently revised under the final travel management rule. The Rule requires consideration of the effects of designating roads, trails and areas on specific resources and components of travel management (36 CFR 212.55(a)). The Rule also contains specific criteria related to designating trails and roads (36 CFR 212.55(b, c)). This document is being prepared in direct response to the direction in this Rule.

Executive Order 11644 as Amended by E.O. 11989 – Executive Order (E.O.) 11644 requires Federal land management agencies to establish policies and procedures for managing motorized vehicles on public lands to protect resources, promote safety of users, and minimize conflicts among users. E.O. 11989 amended E.O. 11644 with additional guidance to protect resources when establishing policies related to motorized travel on public lands. The 2005 Final Travel Management Rule is the agency's method of implementing these executive orders.

Executive Order 13443 – This Order requires Federal land management agencies to consider the effects of agency actions on hunting, hunter participation, and wildlife habitat; to work cooperatively with state and tribal entities on wildlife management; and to consider

programs and recommendations of comprehensive wildlife planning efforts. Chapter 3 discloses the effects of the alternatives on hunting, hunting participation, and wildlife habitat, and on compliance with applicable species specific and other wildlife management plans.

Revised Statute (R.S.) 2477 Rights-of-Way – The 2005 Motorized Travel Rule exemption for legally documented rights-of-way held by State, county or other local public road authorities covers rights-of-way under R.S. 2477 that have been adjudicated through the Federal court system or otherwise formally established. However, Congress has placed a moratorium on rulemaking concerning recognition of any unresolved R.S. 2477 rights-of-way claims. Identification of unresolved R.S.2477 rights-of-way in this document would be contrary to the Congressional moratorium and will not be further discussed here.

Forest Highways Act of 1958 (23 U.S.C. Chapter 200) – Requires that funds available for forest development roads and trails be used by the Secretary of Agriculture to pay for the costs of construction and maintenance thereof, including roads and trails on experimental and other areas under Forest Service administration, or for adjacent vehicular parking areas and sanitary, water, and fire control facilities. Authorizes the Secretary of Agriculture to enter into contracts with a State or civil subdivision thereof, and issue such regulations as he deems desirable.

National Highway Safety Act of 1966 (23 U.S.C. 402) – Authorizes State and local governments and participating Federal agencies to design, construct, and maintain roads in accordance with safety standards; to apply sound traffic control principles and standards; and to promote pedestrian safety. Pursuant to a Memorandum of Understanding (MOU) between the Forest Service and the Federal Highways Administration (FHWA), Maintenance Level 3, 4 and 5 roads are subject to “open to public travel” regulations.

This Draft EIS is tiered to the Final EIS for the Revised Land and Resource Management Plan for the Black Hills National Forest (USDA Forest Service 1996a); and the Final Environmental Impact Statement for the Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the Black Hills National Forest (USDA Forest Service 2005a). This analysis incorporates by reference the 1997 Revised Land and Resource Management Plan (Forest Plan) for the Black Hills National Forest, As Amended by the Phase II Amendment (USDA Forest Service 2006a), and the entire record for this project.

Consistency between Federal Management and State Law

The Forest Service generally defers to state laws regarding the operation of motor vehicles on roads. The Rule allows designations on Forest roads that pre-empt, or vary from state law (36 CFR 212.5(a)(1, 2)). It is the intent of the Forest Service to comply with state laws while providing for a reasonable and safe range of travel and recreation options. However, if the Forest Service allows a road designation that varies from state designation, a road-use analysis will be completed prior to the decision to inform the decisionmaker of the safety implications.

Motorized Mixed Use – The use of both highway-legal and non-highway-legal vehicles on a NFS road.

A potential point of conflict between state law and any decision on this project could involve motorized mixed use on public roads. Motorized mixed use is defined for purposes of this analysis as the designation of a NFS road for use by both highway-legal and non-highway-legal motor vehicles (USDA Forest Service 2005d). The

concept of motorized mixed use pertains entirely to the licensing and registration of vehicles under state law. The concept is independent of the licensing of vehicle operators. This DEIS does not consider alternatives to current state law regarding operator licensing.

South Dakota State laws related to roads fall under South Dakota Codified Laws Title 32, Motor Vehicles (SDCL 32-20). South Dakota law requires that motor vehicles operated on public roads within the state be highway-legal. This means the vehicle must be properly equipped and must be registered with a valid license plate. The State of South Dakota has interpreted this requirement to apply to all Forest Service Maintenance Level 2, 3, 4, and 5 roads. The law also requires that the operator possess a valid state driver's license.

Wyoming State law allows the mixed use of properly outfitted, licensed, highway-legal multipurpose vehicles (MPVs) with non-highway legal vehicles on public highways under the State ORV (off-road vehicle) Program. Roads designated under this program are referred to as "enrolled roads". The law also requires that motor vehicle operators possess a valid state driver's license while operating on roads.

Maintenance level – This concept defines system roads by the level of service they provide and the maintenance they require.

Maintenance level 1 (ML1) – Roads closed to vehicular traffic; may be open and suitable for nonmotorized uses.

Maintenance level 2 (ML2) – Roads open for use by high-clearance vehicles but not passenger cars. Typically involve low traffic volume and low speed.

Maintenance level 3 (ML3) – Roads open for travel by prudent drivers in a standard passenger car. User comfort and convenience are low priorities. Typically single-lane, low-speed routes.

Maintenance level 4 (ML4) – Roads providing a moderate degree of user comfort and convenience. Typically double-lane and aggregate-surfaced, with moderate traffic volume and speed.

Maintenance level 5 (ML5) – Roads providing a high degree of user comfort and convenience. Typically double-lane, paved, with the highest traffic volume and speeds.

A motorized-mixed-use analysis is a systematic process that determines the safety and liability when allowing both licensed and unlicensed vehicle use on the same public road at the same time. Because the Forest Service is a public road management agency, allowing the use of unlicensed vehicles on Forest Service roads open to the public must be analyzed. The decision to allow motorized mixed use must be documented and approved by a Forest Service decisionmaker. The motorized-mixed-use analysis will be completed when the Final EIS for this project is developed. The Forest Supervisor will consider both when deciding what network of roads will be open to OHV use.

Purpose and Need for Action

The purpose of this action is to improve management of motorized vehicle use on NFS lands within the Black Hills National Forest in accordance with regulations at 36 CFR Parts 212, 251, 261, and 295, and as described in *Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule* (70FR68264). This action is needed to:

- **Identify an official travel system and update the Forest travel map.** The National direction requires Forests to clearly designate their motorized transportation system by class

- **Develop a transportation system to meet the increasing demand for recreational travel opportunities and to provide a range of quality experiences for a wide variety of Forest users.** Recreational use, including motorized travel, on the Forest has increased since the 1997 Forest Plan was published. The rapid increase of recreational activity on the Forest is partially in response to population growth, private land development, events such as the Sturgis Motorcycle Rally, and attractions including Mt. Rushmore National Memorial, Custer State Park, and Wind Cave National Park. Individuals drawn to these events and destinations often enjoy recreational opportunities on the Forest, including hiking, camping, fishing, hunting and motorized travel (USDA Forest Service 2005).

  Increased recreational use on the Forest has also contributed to the overuse of recreational facilities, resource impacts, and increased conflicts between owners of private property and Forest recreational users. In response to Forest Plan Goal 4, the Forest strives to provide a range of quality recreation experiences to the public within the capability of the Forest's resources. It is timely to review the Forest's capability to provide a variety of recreational opportunities given the change in demand.
- **Reduce adverse impacts caused by unmanaged cross-country and road and trail usage in order to maintain and conserve the condition of ecosystems and watersheds.** Effects to resources have increased as travel on the Forest has increased. Legal and stewardship mandates require the Forest Service to maintain and restore ecosystems and watersheds. Forest managers and the public have expressed concern about the capability to maintain an increasingly large network of roads and trails. Roads and trails in disrepair can prevent the Forest from meeting resource protection goals. There are also concerns about maintenance and resource damage on roads and trails that are no longer needed to meet public or agency needs. Legally, road and trail funding on National Forests can only be used for authorized routes. Currently, there is no way to pay for maintenance or corrective measures such as road and trail structures on unauthorized routes.
- **Specify roads, trails, and areas open to motorized use.** The Travel Management Rule requires the Forest to designate roads, trails, and areas open to motorized use and to specify the type of vehicle and season of use for each (Federal Register 2005:70FR68264). Current Forest travel maps display roads, trails, and areas that are open or closed to motorized use, but do not officially designate routes and areas open to motorized use. Under the authority of the Rule, these maps do not create a legal basis for law enforcement.
- **Closely align travel and recreation opportunities offered to the public with the Forest's management capability.** Unmanaged recreation has been identified by the Forest Service as one of the Four Threats to the Health of the Nation's Forests and Grasslands (USDA Forest Service 2004). The Code of Federal Regulations (36 CFR 212.55) requires the responsible official to consider the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated and the resources for that maintenance and administration are available. Proactively designating and actively managing system roads, trails, and areas could help reduce management cost and focus limited resources.

Decision Framework

Given the purpose and need, the Forest Supervisor will review the proposed action and alternatives, significant issues, the environmental consequences of each alternative, and public

comments, and will make the following decisions concerning the management of motorized travel on the lands in the project area:

- Whether to designate certain routes, trailheads and other facilities as open to the public for motorized use.
- Whether to authorize improvements to certain routes to allow their use, and if so, the nature of those improvements.
- Whether to allow motorized game retrieval and motorized dispersed camping or off-road parking.
- The season or types of public motorized use allowed for those routes open to motorized travel.
- Whether to amend existing Forest Plan direction to allow implementation of the selected travel management alternative.

Site-specific analysis is incorporated into this document to support the authorization of construction and reconstruction of trails. However, interdisciplinary (ID) team specialists did not evaluate the physical decommissioning of roads or trails, thus no decision to physically close and decommission roads or trails will be made based on the analysis in this document.

Proposed Action

Early development of the proposed action involved extensive consultation with many individuals and groups. Some of this work was conducted by the National Forest Advisory Board. Other efforts were conducted by the Forest Service. The following section summarizes these efforts.

National Forest Advisory Board Efforts

The Forest conducted preliminary public involvement from April 2003 to November 2007 through the work of the Black Hills National Forest Advisory Board (NFAB). This board was chartered under the Federal Advisory Committee Act (FACA) in 2003. In March 2005, the Board established the Travel Management Subcommittee (the Subcommittee) to develop recommendations to the larger NFAB for travel management on the Forest. It was intended that advice provided by the NFAB would be used by the Forest Service to develop a proposed action or alternatives to be considered in the EIS. Members appointed to the Subcommittee represented a wide variety of interests, including both motorized and nonmotorized recreationists.

To assist their efforts in evaluating the potential for establishing a designated OHV trail system on the Forest, the Subcommittee distributed a User Needs Questionnaire to solicit input from both OHV and non-OHV users. By December 2005, some 559 responses had been received. To supplement the information received from this effort, the Subcommittee also conducted four public meetings in South Dakota and Wyoming in which they listened to ideas, suggestions and concerns from off-highway vehicle users, outdoor recreationists, interested stakeholders and community members.

NFAB Recommendations - Based on public input solicited and received, the Subcommittee issued a report on June 8, 2006 (Blair et al. 2006). The report contained eleven core recommendations regarding design and management of a designated system of roads, trails, and areas. The report made it clear that these recommendations “are intended to be general in nature.” The eleven recommendations offered by the Travel Subcommittee to the NFAB are incorporated by reference in this analysis, and are summarized as follows:

1. **Our Setting/Niche** – "The Subcommittee recognizes that motorized vehicle use including OHVs is an important part of the recreation experience on the Black Hills. The Subcommittee recommends that an OHV trail system be developed, within the context of overall motorized uses, which provides for a variety of opportunities but does not dominate or unreasonably interfere with other multiple uses on the Forest."

2. **Active or a Passive System?** "The Subcommittee recommends an 'active' system versus a passive one. A ***passive system*** is similar to what we have today—routes and areas are designated as open or closed, and people use these routes/areas as desired. An ***active system*** is one that is specifically designed, maintained, and enforced to provide for specific uses. The Subcommittee recognizes that funding would play a large role in the size and nature of the system." (Emphasis added.)

3. **What are the economic and funding issues?** "The Subcommittee recognizes that the size and nature of an OHV system will depend substantially on the funding sources available. The Subcommittee supports pursuing all possible funding options."

4. **What would be the role of the States and local communities in developing and managing an OHV trail system?** "The Subcommittee recommends that OHV management on the Black Hills National Forest be a cooperative effort between the Forest Service, the States of South Dakota and Wyoming, and local counties. The Forest Service would have primary responsibility for an OHV trail system (as well as other transportation systems) on NFS lands."

5. **What should the system look like/consist of?** "The group likes the concept of "Gateway Communities" or of at least connecting/tying in communities in some fashion. In general, the system should consist of a main arterial system extending throughout the Black Hills and a network of routes branching off the main system. The focus would be on multiple scale loops as opposed to dead-end spurs. Many of the routes would be shared by multiple users… The group recognizes that, for the most part, there are already an adequate number of routes on the Forest that could be developed into a system [and that] some current, non-system routes may need to be included in the system." The Subcommittee stated that they did not envision that a large number of new routes would be developed, and that the development of new connections or "limited new routes…should be off-set by the removal of other existing routes. In the end, there should be less 'tracks on the ground' than currently exists."

6. **How do we address populated areas?** "General consensus was that it is important to limit the amount of noise and potential conflicts adjacent to communities/ subdivisions, and that an OHV trail system should focus more on areas away from populated areas." The Subcommittee recognized that concentrating motorized use near populated areas "can be a nuisance for some and cause conflicts" and that efforts should be made to reduce this nuisance and conflicts. The Subcommittee noted that providing motorized access from these areas while reducing conflicts could be "the most difficult aspect of the entire process."

7. **Game Retrieval** – "The Subcommittee recommends that allowances be made for game retrieval as part of the motorized use designation process." The Subcommittee recommended further that the program on the Forest should be consistent with other Federal and State agencies, notably Custer State Park, and that "No unacceptable

resource damage, as defined by the Forest Service, will occur as part of retrieval operations."

8. **Firewood Collecting** – The Subcommittee recognized that many residents collect firewood on the Forest to heat their homes, and recommended "that motorized use to collect firewood:

    a. Require a firewood permit.

    b. Be limited to areas designated by the Forest Service which can be modified as needed."

9. **Dispersed Camping** – "The Subcommittee recommends that dispersed camping using motorized vehicles off designated routes be allowed, but motorized vehicles be restricted to within 300 feet of an open, designated route using the most direct route to the camp site."

10. **Cross-Country Motorized OHV Use** – "The Subcommittee recommends that cross-country motorized OHV travel be allowed only within designated areas. Exceptions to this would be for administrative and permitted uses, public safety, fire suppression, and search and rescue." The Subcommittee offered no recommendation as to the size and nature of these designated areas.

11. **Mud-Bogging** – "The Subcommittee recommends that no mud-bogging be allowed on National Forest System lands," noting the resource damage that accompanies such use.

Forest Service Efforts

The Forest Service also conducted work outside the framework of the NFAB. During this preliminary public involvement stage, Forest leadership met with Indian tribal leadership to consider the travel planning process. The Forest Service also sponsored and conducted workshops. The Forest, in cooperation with the National Off-Highway Vehicle Conservation Council (NOHVCC) conducted an OHV Route Designation Workshop in October 2006 for agency personnel and the public. The purpose of this workshop was to acquaint agency personnel and the public with the Travel Management Rule and its implementation. In November 2006, the Forest conducted four "Travelways" workshops. The purpose of these workshops was to gather public input and ideas for developing a proposed action. Individuals attending these workshops identified routes they felt should remain open for public use on Forest lands, and suggested changes or additions to the travel system. Participants at these workshops contributed site-specific information that was used to develop the proposed action.

The Forest then convened decisionmakers and resource specialists from the Supervisor's Office and all four Ranger Districts, to design and display a motorized travel system that would follow the NFAB recommendations and meet public desires expressed up to that time. The aim was to develop a system that would also reduce or minimize potential resource damage, and be practical to implement.

Proposed Action

To meet the purpose and need, the Forest Service proposes to designate certain roads and trails open to wheeled, motorized-vehicle travel on lands administered by the Forest. The agency believes it is appropriate and necessary to assign a class of vehicle and season of use to these designated roads or trails. The agency also believes that the proposed, consciously designed, or

"active" motorized travel system would improve on the current "passive" unmanaged system, which has evolved in an unplanned manner over time. An active system would meet a variety of motorized and nonmotorized recreation needs and desires while reducing effects of motorized recreation on natural resources and neighbors.

Motor vehicle use map (MVUM): A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the NFS (36 CFR 212.1).

Specifically, the action proposed by the Forest Service would greatly increase the miles of motorized trails from the current 36 miles to 663 miles. This would provide over 400 miles of trails for vehicles 50 inches or less in width, and 76 miles of motorcycle trails. This proposal would further designate 2,226 miles of road to fill out the system for motorized mixed use by both highway-legal and non-highway-legal vehicles. An additional 1,242 miles of road would be open to highway-legal vehicles only. These routes open to public use would be officially designated on a Forest motor vehicle use map. Routes not shown would be closed to motorized use. Map display would make it easier for recreationists to comply with the system, and for the agency to enforce it. Finally, cross-country travel would be allowed on 177,000 acres of NFS land for the purposes of retrieving downed game and dispersed camping. This would reduce cross-country travel from the current 864,000 acres with the intent to improve natural resource conditions. This proposal is further described in Chapter 2, Alternatives, under Alternative B.

By implementing this proposal, the Forest would comply with requirements of the 2005 Travel Management Rule (36 CFR Part 212). As a result of these travel management decisions, the Forest would produce a motor vehicle use map depicting those routes and areas on the Forest that would be open to motorized travel. The motor vehicle use map would be the primary tool used to determine compliance and enforcement with motorized travel designations on the ground. All other routes, including existing Forest routes and user-created routes not designated open on the motor vehicle use map, would be closed to motorized travel. This would represent a major change from the current situation in which routes and areas are generally considered open to motorized travel unless specifically closed.

Public Involvement

This section of the EIS describes public involvement efforts that occurred in the formal analysis process. Public involvement occurring prior to that point was described in the Proposed Action section.

Initial contact with the public at the beginning of the formal analysis process is referred to as scoping. The intent of scoping is to better define the bounds of the proposal and to identify concerns the public may have with it. The Notice of Intent (NOI) initiating the scoping process was published in the Federal Register on September 11, 2007 (72FR51772). The NOI requested public comment over a 60-day period ending November 13, 2007. As part of the scoping process in September 2007, the Forest hosted four public meetings in Wyoming and South Dakota. These meetings were attended by over 700 people. The purpose of the public meetings was to introduce the Travel Management Plan process and solicit additional comments. Open houses were also held in October 2007 at the four Forest ranger district locations, at which the district rangers were present. The public provided additional site-specific route input at these open houses. Several of the comments obtained at the open houses provided specific information concerning the current inventory of non-system (unauthorized) roads, trails, and

areas. Information pertaining to the current inventory of non-system roads, trails, and areas was used to update the computerized inventory base layers.

The Forest received more than 700 emails and letters during the public scoping period. The interdisciplinary team analyzed over 2,000 comments derived from these emails and letters using an established analytical process known as content analysis. Comments were sorted and categorized in a database, and individually evaluated. The interdisciplinary team used the comments from the public and other agencies to develop a list of issues that would be addressed in the Travel Management Plan. The issues are introduced below and are discussed in detail in Chapter 3 of this document.

Issues

During the public involvement process, the Forest identified public concerns that should be analyzed in detail in the EIS (40 CFR 1501.7). These concerns are summarized below as issues. Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and to compare trade-offs for the decisionmaker and public to understand.

These issues were separated into two groups: significant and nonsignificant issues. Issues were determined to be significant if an effect or conflict would result from implementing the proposed action. The significant issues become the focus of the analysis and guide alternative development. On the other hand, issues were determined to be nonsignificant if they were found to be: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. All public scoping comments were considered by the interdisciplinary team and the responsible official, and are documented in the project record. Comments and their disposition are summarized in Appendix D.

Significant Issues and Indicator Measures

After reviewing and analyzing agency and public responses, the following significant issues were identified. The Forest focused on articulating the significant issues identified by the public that guided the development of a range of alternatives to the proposed action. These issues are analyzed in detail in Chapter 3. Indicators were developed for each issue to help define the issue, and to evaluate the effects of the proposed action and the alternatives. The issues and their associated indicators are described below.

Issue 1: Effects on natural and cultural resources

The alternatives considered in the DEIS may have effects on natural and cultural resources. Natural resources of most concern include certain plant and wildlife species, soil and water, and the threat of invasive species. Effects to these resources will vary between alternatives and are mostly dependent on the miles of roads and trails open to motorized use. Restricting motorized use to a managed system of designated roads and trails, identifying specific seasons of use, and identifying authorized types of vehicle use, would improve protection for these natural and cultural resources. Effects to natural and cultural resources between alternatives are identified in detail in the effects analysis in Chapter 3. The following are the primary indicators used to measure the effects to natural and cultural resources. Additional indicators are addressed in the individual resource discussions in Chapter 3.

Indicators

Botanical indicators

- Miles of motorized routes
- Acres open to dispersed camping and game retrieval
- Miles of new routes and reopened closed roads
- Acres of trailheads

Wildlife

- Miles of motorized routes
- Acres open to cross-country use
- Acres open to game retrieval
- Acres open to dispersed camping

Fisheries and Hydrology

- Number of route crossings on perennial streams
- Miles of routes within 30 feet of a perennial stream (floodplain)
- Miles of routes within 119 feet of a perennial stream (WIZ)

Soils

- Acres open to cross-country use
- Acres open to game retrieval and dispersed camping

Cultural Resources

- Miles of routes closed
- Reopen a closed road
- Trail converted from road
- New routes

Range and Noxious Weeds

- Miles of motorized routes
- Acres open to game retrieval
- Acres open to dispersed camping
- Number of motorized trailheads

Issue 2: Effects on recreational opportunities

The alternatives considered in the DEIS may have effects on the amount of available recreational opportunities provided on the Forest, including motorized use on roads and trails, motorized-mixed-use roads, dispersed camping, big game retrieval, motorized trailheads and nonmotorized opportunities. Effects to the recreational opportunities by alternative are identified in detail in the effects analysis in Chapter 3. The following indicators were used to measure the effects on recreational opportunities.

Indicators

- Miles of road open to all vehicles (motorized mixed use)
- Miles of road open to highway legal vehicles only
- Miles of trail open to all vehicles (includes vehicles wider than 50 inches)
- Miles of trail open to wheeled vehicles (50 inches wide or less)
- Miles of motorcycle trail
- Miles of special designations (rock crawling)
- Concentrated, cross-country travel areas less than 5 acres
- Acres open to cross-country use
- Acres open to game retrieval
- Acres open to dispersed camping
- Number of motorized trailheads

Issue 3: Effects of transportation system design on management capabilities

The alternatives considered in the DEIS may have effects on the Forest's ability to proactively designate and manage system roads and trails, while also optimizing recreation experiences. The alternatives considered will have different effects on how the transportation system is able to address management concerns (such as law enforcement, user education, signing, and maintenance) while reducing management costs and focusing limited resources. Addressing many of the management concerns will be dependent on available funding sources, which will most likely be limited. The transportation system design can also affect public safety depending on the miles of motorized-mixed-use roads. Any roads identified for motorized mixed use will be reviewed in a Mixed Use Roads Analysis that includes mitigation to make reasonable accommodations for the public's safety. The following are the indicators used to analyze this issue.

Indicators

- Miles of road open to all vehicles
- Miles of road open to highway legal vehicles only
- Miles of trail open to all vehicles
- Miles of trail open to vehicles 50 inches wide or less
- Miles of motorcycle trail
- Number of trailheads
- Number of perennial stream crossings
- Miles of open roads to be closed
- Miles of closed roads to be reopened
- Miles of road converted to trails
- Miles of new routes to be converted from unauthorized.
- Number of dead-end spurs
- Miles of motorized-mixed-use roads open yearlong
- Miles of motorized-mixed-use roads open seasonally
- Total miles of motorized-mixed-use roads
- Miles of roads at maintenance levels 3, 4 and 5

Issue 4: Social and Economic Concerns

The alternatives considered in the DEIS may affect the economic sustainability of local businesses and communities. Effects may be related to sound level (noise), dust (air quality), trespass and access to private property, distance from motorized routes to private land, traffic levels, and miles of routes open to motorized use. The following are the indicators used to analyze this issue.

Indicators

- Miles of motorized routes within 0.5 miles of a nonmotorized trail
- Miles of NFS motorized routes through or within 300 feet of non-NFS lands
- Number of motorized trailheads within 3 miles of a gateway community
- Miles of motorized routes

Chapter 2. Alternatives, Including the Proposed Action

Introduction

This chapter describes the alternatives considered for the Forest Travel Management Plan. The maps for each alternative considered are included in Appendix I, the map packet. This chapter also presents the alternatives in comparative form, defines the differences between each alternative, and provides a clear basis for choice among options by the decisionmaker and the public. Some of the information used to compare the alternatives is based on the design of the alternative and some of the information is based upon the expected environmental, social, and economic effects that could be expected from implementing each alternative. These effects are discussed in detail in Chapter 3 of this document.

Alternative Development

To support alternative development, information provided by the public and Forest personnel was used to develop a comprehensive inventory map of roads, trails, and areas across the Forest. Public comments on the proposed action, public preferences concerning travel management expressed at meetings, and the knowledge of agency personnel were used to develop the alternative themes. The topics considered in developing the alternative themes include:

- Motorized cross-country use in the form of big game retrieval and dispersed camping
- Looped OHV trail opportunities
- Access points (trailheads)
- Noise
- Conflicts with other uses of the National Forest including nonmotorized recreation
- Effects on cultural resources
- Effects on natural resources including plants, wildlife and watersheds
- Spread of noxious weeds
- Education and law enforcement
- Economic feasibility
- Administrative access

After the alternative themes were established, the alternatives were developed by examining each road, trail (whether system or non-system), and area. The ID team and District staff used site-specific comments and knowledge of specific site conditions to develop a strategy for the management of roads, trails, and areas based on the alternative theme. Alternatives were then checked for consistency with the Forest Plan.

Relationship of Alternatives to Forest Plan Direction

The Forest Plan defines a set of goals, objectives, standards, and guidelines that provide direction for managing the Forest and its resources. The law requires that individual project decisions be consistent with Forest Plan direction. If a project proposal is not consistent with that direction, the project may be modified to make it consistent; it may be dropped; or, the Plan may be amended to allow implementation of the project. The alternatives presented in this

document would manage motorized travel in different ways. Several changes to Forest Plan direction are proposed to update Plan direction and allow implementation of each action alternative.

Forest goals are broad statements that describe overall conditions managers would strive to achieve. They are not directly measurable and there are no timeframes for achieving them. Goals describe the ends to be achieved rather than the means to these ends; they serve as vision statements. **Objectives** provide means in the form of measurable steps required to accomplish goals. Objectives generally are achieved by implementing projects or activities. However, objectives are not targets, which are a measure of annual outputs dependent on budgets.

A **standard** is a course of action that must be followed, or a limit to actions that may be taken when implementing individual projects. Adherence to standards is mandatory. Consistency with the Forest Plan is defined as compliance with standards. Deviations from standards must be analyzed and documented in a Forest Plan amendment with appropriate public involvement.

A **guideline** is a preferred or advisable course of action, or a recommended limit to actions when implementing projects. Deviation from guidelines is allowed with clear and acceptable rationale.

A Forest Plan also establishes additional direction for individual **management areas**, each with a different management emphasis. **Management area direction** includes a desired condition statement and then defines which management activities may be carried out, with additional standards and guidelines as needed to manage or protect specific resources within the boundaries of those areas. Wilderness and developed recreation sites are two examples of management areas with very different management emphasis.

Forest Plan Goals and Objectives

The Travel Management Plan would meet goals and objectives established in the Forest Plan, although the relative emphasis varies by alternative. Some of the relevant goals found in the Forest Plan include:

- (Goal 1) Protect basic soil, air, water, and cave resources.
- (Goal 2) Provide for a variety of life through management of biologically diverse ecosystems.
- (Goal 4) Provide for scenic quality, a range of recreational opportunities and protection of cultural resources in response to the needs of the Forest visitors and local communities.
- (Goal 6) Improve financial efficiency for all programs and projects.
- (Goal 7) Emphasize cooperation with individuals, organizations and other agencies while coordinating planning and project implementation.
- (Goal 8) Promote rural development opportunities.

Relevant Forest Plan standards and guidelines are cited in individual resource sections in Chapter 3, and can be reviewed in the Forest Plan.

Features Shared by All Alternatives

Any selected alternative would provide for the following:

Emergency - Search and rescue and other emergency operations, and the use of any fire, military, or law enforcement vehicle for emergency purposes would be exempted from travel management prohibitions.

Emergency Closure - Emergency closure would be implemented by the responsible official as warranted to protect resources, health and safety, etc. Federal land managers are directed to ensure that the use of motorized vehicles and off-road vehicles are managed to protect the resources of those lands, to promote the safety of users, to minimize conflicts among the diverse uses of the Federal lands, and to provide for public use of routes designated as open. (Executive Order 11644, 26 CFR 212 and 43 CFR 8342.1.)

Future Changes - The final rule recognizes that the designations of roads, trails, and areas for motorized vehicle use are not permanent and that environmental impacts, administrative needs, changes in demand, route construction, and monitoring conducted under the final rule may lead land managers to consider revising designations. (36 CFR 212.54, 212.57.) Nothing in this plan precludes future project-specific environmental analysis from proposing construction of new system roads and trails, or annual changes to roads and trails and areas as conditions warrant.

Administrative Access - The Forest Service would retain administrative access authority sufficient to carry out official business including but not limited to conducting resource surveys, administering contracts and permits, suppressing wildfires or addressing other such emergencies, maintaining roads and other facilities, etc.

Access would also be allowed to contractors and permit holders operating within the terms and scope of their contract or permit, to conduct Government-related business. This specifically would include, but not be limited to commercial traffic such as timber sale purchasers, road contractors, and those holding special use and livestock grazing permits.

Reasonable administrative access would be allowed as appropriate for other local, State and Federal agencies to manage their adjacent or isolated parcels.

If a NFS road or a specially designated OHV trail is needed for timber or fuels management or fire suppression, all OHV use, both highway-legal and non-highway-legal, would be temporarily suspended or could even be permanently discontinued. Substitute routes may, or may not, be designated.

Special seasons of use and other restrictions on operations of all OHVs, both highway-legal and non-highway-legal, would not necessarily pertain to timber, fire, and fuels management activities unless they are applied in a decision to implement those projects.

Language in existing permits or contracts would not be interpreted to allow OHV use where it is otherwise prohibited. For example, a firewood permit that allows the permittee to collect firewood from areas where motorized game retrieval is prohibited would not be construed to allow motorized game retrieval under the guise of collecting firewood.

Description of the Alternatives

The alternatives, including no action and proposed action, are designed to provide a range of options from which the responsible official can make an informed choice. The alternatives, which were developed by an interdisciplinary team of specialists, differ by the relative emphasis given to individual issues and public concerns. After reviewing the issues and grouping them in different combinations, several possible alternative themes emerged. Each represented a

potential travel plan that met the project objectives (purpose and need) and addressed the issues in different ways.

Alternatives considered in detail are described below in terms of their theme and the relationship to the issues. The theme focuses on a particular issue or a group of compatible issues (for example, limiting effects of motorized use to natural resources and reducing conflicts with nonmotorized users). The relationship to issues further explains how specific elements of the issues are addressed by the alternative.

Alternatives Considered in Detail

In addition to no action and the proposed action, the Forest Service developed three other alternatives in response to issues raised by the public. These alternatives are presented after the no action and proposed action alternatives.

Alternative A – No Action

NEPA regulations at 40 CFR 1502.14 require that "agencies shall…include the alternative of no action." This is intended to provide a baseline against which the effects of other alternatives can be measured.

Under this alternative, there would be no change from present management. Current management plans would continue to guide motorized travel in the project area. Current travel patterns, modes of use and enforcement actions would be expected to continue.

Alternative A would continue the current situation. Cross-country motorized use would continue on 864,000 acres in an unregulated manner. The trail system would consist of the existing 36 miles of motorized trails. User compliance and law enforcement would continue to be difficult without an approved MVUM. Resource damage and conflicts with nonmotorized recreationists would continue to take place, and motorized users would not enjoy a planned travel system designed to meet their needs.

There are presently 10,280 miles of existing routes on NFS lands, including some 4,109 miles of known unauthorized routes. There are about 820 miles of other public roads on NFS lands, which would not be affected by the decision on this project. This alternative would continue the current "passive" travel system, meaning a travel system that was not designed to accommodate recreational motorized use of various types. Continuation of use on the current system would not meet the recommendation of the NFAB Travel Subcommittee to establish an "active" motorized travel system. The sheer size of the existing system would continue to present the Forest Service with many maintenance challenges.

No motor vehicle use map would be issued, so no roads, trails, or areas would be officially designated open to wheeled-motorized-vehicle travel on lands administered by the Forest. As a result, if this alternative were selected the Forest Service would not comply with the 2005 travel rule. Future project decisions could consider designating unauthorized routes as part of the travel system; however, no unauthorized routes would be officially designated part of the Forest system by selecting this alternative.

Vehicles - South Dakota State law requires that motor vehicles using public roads be registered and bear a vehicle license (highway-legal). Wyoming State law allows use of both highway-legal and non-highway-legal motor vehicles on certain enrolled roads.

Vehicle Operators - Current State law in both South Dakota and Wyoming requires that motor vehicles on public roads be operated only by licensed drivers.

Cross-country Use - Some 864,000 acres of the Forest currently open to motorized cross-country use would remain open. Motorized cross-country travel presently is undertaken for a variety of purposes including retrieval of big game downed by hunters, dispersed camping, and general OHV recreational traffic.

Currently, no roads or trails are officially designated open to motorized vehicle use under the sense contemplated in the Final Travel Management Rule. Motorized use occurring on roads, trails, and in areas where such use is not specifically prohibited has generally been legal within the bounds of Federal regulation if it is not damaging natural resources. Such motorized use is also generally legal within the bounds of state law if the vehicle is highway-legal and the operator is licensed. Attempts by Forest Service law enforcement personnel to successfully prosecute citations for resource damage in courts of law are made more difficult by the need to witness the accused in the act of damaging resources. Since law enforcement officers do not witness most such instances, many cases are not prosecuted fully. If Alternative A were selected, it is expected that these enforcement difficulties would continue. It is expected that the use of unauthorized routes, and the proliferation of new unauthorized routes, would also continue. Motorized recreation opportunities under Alternative A are characterized in Table 1.

Table 1. Indicators of motorized recreation opportunities in Alternative A (no action)

Indicators	**Alternative A (current condition)**
Roads	
Miles of road open to all vehicles ***(motorized-mixed-use roads)***	160
Miles of road open to highway legal vehicles only *(non-highway-legal vehicles prohibited)*	3,580
Total miles of roads	**3,740**
Trails	
Miles of trail open to all vehicles	0
Miles of trail open to vehicles 50” or less in width	36
Miles of motorcycle trail	0
Miles of special designations	0
Total miles of trails	**36**
Total miles of proposed motorized routes	**3,776**
Number of motorized-use trailheads	7
Area open to Motorized Cross-country Use	
Acres open to dispersed camping (motorized)	864,000
Acres open to game retrieval (motorized)	864,000
Acres open to cross-country travel (non-game retrieval)	864,000
Total area open to motorized cross-country travel (acres) *(Note: not additive)*	**864,000**

Please refer to Table 7 for parameters further describing this alternative, and to compare this alternative to others.

Action Alternatives – Alternatives B through E

Alternatives B through E are referred to in this document as the action alternatives, to distinguish them from Alternative A, the no action alternative. The action alternatives include Alternative B, the modified proposed action, and Alternatives C, D and E, which were developed to address concerns expressed by the public about the proposed action.

Features Common to Action Alternatives

The following features would be incorporated in each action alternative unless stated otherwise.

Compliance with the 2005 Travel Management Rule - Each action alternative would designate selected roads and trails open to motorized-vehicle travel on lands administered by the Forest, and set specific seasons and types of use for designated roads, trails and areas. Coupled with publication of the Forest motor vehicle use map (see below), the Forest Service would comply with the requirements of the 2005 Travel Management Rule (36 CFR Parts 212, 251 and 261).

Motor Vehicle Use Map - For any action alternative selected, a motor vehicle use map would be produced depicting those routes and areas that would be open to motorized travel. The motor vehicle use map would be the primary tool used to determine compliance with and to enforce motorized travel designations. Routes not designated open on the motor vehicle use map would be legally closed to motorized travel except for administrative access. User responsibilities and law enforcement would focus on compliance with the motor vehicle use map, pursuant to regulations at 36 CFR 261, Subpart A. The Forest Service believes this would tend to improve user understanding of acceptable behavior and use of the motorized system, and to facilitate enforcement and prosecution of violations.

Sound - A stationary sound limit of 96 decibels (dB(A)) is proposed for OHVs including motorcycles operating on designated routes and areas administered by the Black Hills National Forest. The stationary sound test procedure provided by the Society of American Engineers (SAE J1287) would be the standard used to determine compliance with this sound limit. Enforcement would be based on measurement conducted by Forest trail rangers and law enforcement personnel, but measurement for educational purposes could also be performed by dealers, clubs, and other groups. A Forest order may be needed to implement this feature.

New Construction Efforts Associated With Action Alternatives B, C, and D - Alternatives B, C, and D involve designating between 181 and 460 miles of routes as trails 50 inches or less in width (year-round and seasonal), between 21 and 134 miles of motorcycle trails, and between 23 and 34 trailheads. Many of the trails proposed to be designated are roads currently closed (Maintenance Level (ML) 1), low-standard roads (ML 2), unauthorized routes that were old roads, routes that were pioneered by cross-country travel, or trails that are proposed but currently have no physical form on the ground. Construction efforts needed to provide an environmentally sustainable trail system from these beginnings would include several different tasks. These would include reconstructing some existing ML 1 roads and some old roadbeds to support and endure concentrated ATV or motorcycle traffic, constructing new engineered trails where only tracks now exist, constructing stream crossings (bridges, culverts, etc.) where needed, and constructing new trailheads. The construction methods would vary depending on the level of

effort needed, and could involve use of equipment ranging from a small trail dozer to a road grader to rework existing roadbeds or create a parking lot for a trailhead.

Game Retrieval and Dispersed Camping in Action Alternatives B and C - Limited motorized cross-country use would be allowed in Alternatives B and C for the purposes of retrieving legally harvested game and for dispersed camping. Motorized game retrieval and dispersed camping would be allowed where shown on the alternative maps, and as generally described in the alternative descriptions. For game retrieval, there would be no restriction on time of day. Only one vehicle would be allowed off-road to retrieve each downed animal, but more than one pass of this single vehicle would be allowed as needed. Persons retrieving a game animal would be required to use the most direct route to and from the nearest designated open route, possess a valid hunting license, and keep weapons cased during game retrieval.

For both game retrieval and dispersed camping, resource damage would not be allowed as a result of the activity (for example, cutting live vegetation or leaving wheel ruts on the ground). Crossing streams would not be allowed if water is present (except on designated routes), and crossing wetlands would not be allowed.

Alternative B – Modified Proposed Action

Alternative B represents the action proposed by the Forest Service to the public during scoping. It has been modified since that time to correct data errors, and some routes or areas have been added or deleted. However, the intent of this alternative is the same as the original proposed action on which the public was asked to comment at scoping. Alternative B incorporates, to a greater degree than any other alternative, the initial input from the National Forest Advisory Board and Travel Subcommittee, and citizen-user input received during the scoping process, public meetings and workshops. This alternative also incorporates agency knowledge of resource conditions and risks of damage to resources.

> **Alternative B** would meet most NFAB recommendations to provide an active travel system while protecting resources and reducing conflicts with other users. It would provide 2,226 miles of mixed-use roads and boost motorized trails to 663 miles, and limit cross-country motorized use to 179,000 acres for game retrieval and dispersed camping only. The MVUM would make user compliance and law enforcement easier. Resource damage and conflicts with nonmotorized recreationists would be reduced, and motorized users would find a planned travel system designed to meet their needs.

The intent of this proposal is to provide for diverse motorized recreation opportunities on an active (consciously designed) motorized travel system of designated roads and trails. The system would limit effects to natural resources, as well as conflicts with nonmotorized recreationists. This alternative would limit cross-country motorized travel to specified distances from certain roads for the sole purposes of game retrieval and dispersed camping, with certain exceptions provided by law. This would represent a major reduction from the current situation in terms of the total area on which motorized cross-country travel would be allowed, and the types of use allowed on that area. This alternative would designate almost as many miles of motorized routes near adjacent private lands as in Alternatives A, C and E.

Alternative B would increase the number of miles of motorized forest trails from 36 to 663 (a 627-mile increase), and increase the miles of forest roads where motorized mixed use is allowed from 160 to 2,226 (a 2,066-mile increase; see Table 2). The number of motorized-use trailheads

would increase from 7 to 31. Motorized cross-country use for the sole purposes of game retrieval or dispersed camping would be reduced from 864,000 to 179,000 acres (a 685,000-acre decrease). Total NFS route mileage used would decrease by over 4,000 miles to 4,950 miles, and the number of motorized road and trail crossings on perennial streams would decrease by more than 1,200 to 547. Please refer to Table 7 for parameters further describing this alternative, and to compare this alternative to others.

Table 2. Motorized recreation opportunities in Alternative B, the proposed action

Indicators	Alt. B	Current condition
Roads		
Miles of road open to all vehicles ***(motorized-mixed-use roads)***	2,226	160
Miles of road open to highway legal vehicles only ***(non-highway-legal vehicles prohibited)***	1,240	3,580
Total miles of roads	**3,466**	**3,740**
Trails		
Miles of trail open to all vehicles	147	0
Miles of trail open to vehicles 50" or less in width	414	36
Miles of motorcycle trail	76	0
Miles of special designations	25	0
Total miles of trails	**663**	**36**
Total miles of proposed motorized routes	**4,129**	**3,776**
Number of motorized-use trailheads	31	7
Area open to Motorized Cross-country Use		
Acres open to dispersed camping (motorized)	63,500	864,000
Acres open to game retrieval (motorized)	179,000	864,000
Acres open to cross-country travel (non-game retrieval)	0	864,000
Total area open to motorized cross-country travel (acres) *(Note: not additive)*	**179,000 (limited)**	**864,000**

Permits would need to be secured prior to any in-water construction work on six proposed new perennial stream crossings, pursuant to Section 404 of the Clean Water Act (see Appendix B, design criteria for fisheries and hydrology). Stormwater permits under Section 402 would be required for construction exceeding one acre in size on trailheads or other facilities.

This alternative would provide for motorized mixed use (meaning use by both highway-legal and non-highway-legal motor vehicles) on a designated system of roads (primarily Level 2 with some Level 3, 4 and 5 roads). In response to recommendations from the NFAB, and scoping comments, this system would feature travel loops within concentrated motorized use areas (CMUAs), and routes connecting CMUAs.

CMUA (Concentrated Motorized Use Area) – a defined area featuring smaller-scale loop routes and other motorized travel opportunities.

Vehicles - By providing for use by both highway-legal and non-highway-legal motor vehicles, this alternative, if

selected, would pre-empt (not be in accord with) South Dakota State law in its current form, which requires that only highway-legal motor vehicles may use public roads. Wyoming State law provides for use of both highway-legal and non-highway-legal motor vehicles on certain roads officially recognized (enrolled) by the State. If this alternative were selected, the Forest Service would comply with Wyoming State law by enrolling all designated roads in the Wyoming program.

Vehicle Operators - It is important to understand that only users with a valid state driver's license (from any state) would be legally allowed to operate motor vehicles on the roaded portion of the motorized travel system in this alternative. Unlicensed operators could legally operate a motor vehicle only on the trail portion of the system. This would comply with current State law in both South Dakota and Wyoming. Please refer to Table 6 for more information on vehicle and operator requirements, and motorized-mixed-use opportunities available under this alternative.

Cross-country Use- Unrestricted motorized cross-country use would not be allowed in this alternative. Instead, limited motorized cross-country use would be allowed for retrieving harvested elk only (not deer) within 300 feet of certain designated roads; and, for dispersed camping within 100 feet of certain designated roads. Motorized cross-country travel would not be allowed for any other purpose or in any other location, with certain exceptions provided by law. Total area available to limited motorized cross-country use in this alternative would be 179,000 acres.

A Forest Plan amendment would be required to implement this alternative. Changes to existing Forest Plan direction would take two general forms. First, where existing objectives provide quantities for road and trail mileage and cross-country area, these would be updated to conform to the quantities provided by this alternative. Second, certain standards and guidelines would be updated to conform to the Final Rule and amended regulations, to provide that motorized vehicle use would be allowed on roads, trails, and areas only as shown on the motor vehicle use map or as contained in a Forest Travel Order. Refer to Appendix F for specific changes to existing Forest Plan direction proposed under this alternative. It is anticipated that these proposed changes would constitute a minor or nonsignificant Forest Plan amendment.

Alternative C

The intent of Alternative C is to create more motorized recreation opportunities than any other alternative on an active, designed system of looped roads and trails. This alternative would provide cross-country travel opportunity on a larger area than in Alternative B for the purposes of game retrieval or dispersed camping in specified areas. Allowing higher levels of motorized recreation use on the Forest and close to communities is intended to provide more economic opportunity for nearby communities and businesses. To a lesser degree, this alternative considers effects of use on natural resources, and the concerns of adjacent landowners, by allowing more miles of use near adjacent private lands.

> **Alternative C** would provide the largest travel system. It would provide 2,878 miles of mixed-use roads and boost motorized trails to 771 miles, and limit cross-country motorized use to 473,500 acres for game retrieval and dispersed camping only.
>
> The MVUM would make user compliance and law enforcement easier. Higher user numbers could bring more business to adjacent communities, and motorized users would find a planned travel system designed to meet their needs.

Alternative C would increase the number of miles of motorized forest trails from 36 to

771 miles; and increase the mileage of forest roads where motorized mixed use is allowed from 160 to 2,878 miles (see Table 3). The number of motorized-use trailheads would increase from 7 to 34. Three small concentrated motorized cross-country areas are proposed in this alternative. These three areas total 10 acres in size. Two would be located on the Bearlodge Ranger District (Bearlodge Pit on the north end, and Hain Spring Pit in the south); a third would be located on the Northern Hills Ranger District at the Spearfish Quarry near the City of Spearfish. These areas could serve as practice areas for novice riders, or play areas for younger riders. Other than these three areas, motorized cross-country use would be reduced from 864,000 acres to 473,500 acres, for the sole purposes of game retrieval or dispersed camping. Total NFS route mileage used would decrease from 8,971 to 5,173 miles, and the number of motorized road and trail crossings on perennial streams would decrease from over 1,700 to 536. Permits would need to be secured prior to any in-water construction work on five proposed new perennial stream crossings, pursuant to Section 404 of the Clean Water Act (see Appendix B, design criteria for fisheries and hydrology). Stormwater permits under Section 402 would be required for construction exceeding one acre in size on trailheads or other facilities.

This alternative would provide for motorized mixed use (meaning use by both highway-legal and non-highway-legal motor vehicles) on a designated system of roads (primarily Level 2 with some Level 3, 4 and 5 roads). In response to recommendations from the NFAB, and scoping comments, this system would feature travel loops within concentrated motorized use areas, and routes connecting CMUAs.

Table 3. Motorized recreation opportunities in Alternative C

Indicators	Alt. C	Current condition
Roads		
Miles of road open to all vehicles ***(motorized-mixed-use roads)***	2,878	160
Miles of road open to highway legal vehicles only ***(non-highway-legal vehicles prohibited)***	704	3,580
Total miles of roads	**3,582**	**3,740**
Trails		
Miles of trail open to all vehicles	154	0
Miles of trail open to vehicles 50” or less in width	460	36
Miles of motorcycle trail	134	0
Miles of special designations	22	0
Total miles of trails	**771**	**36**
Total miles of proposed motorized routes	**4,353**	**3,776**
Number of motorized-use trailheads	34	7
Area open to Motorized Cross-country Use		
Acres open to dispersed camping (motorized)	184,000	864,000
Acres open to game retrieval (motorized)	373,000	864,000
Acres open to cross-country travel (non-game retrieval)	10	864,000
Total area open to motorized cross-country travel (acres) *(Note: not additive)*	**473,500 (limited)**	**864,000**

Vehicles - By providing for use by both highway-legal and non-highway-legal motor vehicles, this alternative, if selected, would pre-empt (not be in accord with) South Dakota State law in its current form, which requires that only highway-legal motor vehicles may use public roads. Wyoming State law provides for use of both highway-legal and non-highway-legal motor vehicles on certain roads officially recognized (enrolled) by the State. If this alternative were selected, the Forest Service would comply with Wyoming State law by enrolling all designated roads in the Wyoming program.

Vehicle Operators - It is important to understand that only users with a valid state driver's license (from any state) would be legally allowed to operate motor vehicles on the roaded portion of the motorized travel system in this alternative. Unlicensed operators could legally operate a motor vehicle only on the trail portion of the system. This would comply with current state law in both South Dakota and Wyoming. Please refer to Table 6 for more information on vehicle and operator requirements, and motorized-mixed-use opportunities available under this alternative. Please refer to Table 7 for parameters further describing this alternative, and to compare this alternative to others.

Cross-country Use - Unrestricted motorized cross-country use would be allowed in three small concentrated cross-country areas as described earlier. Other than this, limited motorized cross-country use would be allowed to retrieve harvested elk and deer in certain large designated areas; and, for motorized dispersed camping within 300 feet of certain designated roads. Motorized cross-country travel would not be allowed for any other purpose or in any other location, with certain exceptions provided by law. Total area available to limited motorized cross-country use in this alternative would be 473,500 acres.

In their scoping comments, the State wildlife management agencies of South Dakota and Wyoming requested that hunters be allowed adequate access to much of the Forest to retrieve harvested game using motorized vehicles. The Forest Service attempted to plot a one-mile distance off certain designated roads for such use, as proposed by the State of South Dakota, but found that this approach left slivers and small areas of land on which this use would not be allowed. The Forest Service felt this would pose problems for hunters attempting to stay within the allowed distances off of roads.

In an effort to respond to the States and others who commented, and to provide a range of alternatives for motorized game retrieval, the Forest Service chose instead to delineate areas within which motorized game retrieval would be allowed. These large areas do not include those management areas where motorized cross-country use is specifically prohibited, such as wilderness; or those areas with a year-round closure to motorized cross-country use. Although the Forest Service believes hunters would find it easier to comply with this approach, it is not technically consistent with the Travel Rule, which stipulates that any motorized game retrieval areas be designated by distance off of roads. For this reason, any decision to implement this alternative may require some modification to comply with the Travel Rule.

A Forest Plan amendment would be required to implement this alternative. Changes to existing Forest Plan direction would take two general forms. First, where existing objectives provide quantities for road and trail mileage and cross-country area, these would be updated to conform to the quantities provided by this alternative. Second, certain standards and guidelines would be updated to conform to the Final Rule and amended regulations, to provide that motorized vehicle use would be allowed on roads, trails, and areas only as shown on the motor vehicle use map or as contained in a Forest Travel Order. Refer to Appendix F for specific

changes to existing Forest Plan direction proposed under this alternative. It is anticipated that these proposed changes would constitute a minor or nonsignificant Forest Plan amendment.

Alternative D

This alternative would provide a smaller active motorized transportation system than that provided by any other alternative. No cross-country motorized opportunity would be allowed under this alternative. The intent of this alternative is to limit the level and likelihood of effects on natural and cultural resources through a smaller motorized travel system. This alternative is intended to reduce conflicts with nonmotorized recreationists and could provide more area and solitude for these users. Alternative D would allow less motorized use near adjacent private landowners than any other alternative, and would provide fewer trailheads near adjacent communities and businesses.

> **Alternative D** would provide the smallest motorized travel system, and would emphasize user safety. It would provide 580 miles of mixed-use roads and 320 miles of motorized trails, and prohibit motorized cross-country use for any reason, with exceptions.
>
> The motor vehicle use map would make user compliance and law enforcement easier. Resource damage, conflicts with nonmotorized recreationists and system maintenance costs would be reduced, and motorized users would find a planned travel system designed to meet their needs.

Alternative D would increase the number of miles of motorized forest trails from 36 to 320 miles; and increase the mileage of forest roads where motorized mixed use is allowed from 160 to 580 miles (see Table 4). The number of motorized-use trailheads would increase from 7 to 23. No motorized cross-country use would be allowed for any purpose (with exceptions for emergency and administrative access as described above). Total NFS route mileage used would decrease from over 8,900 miles to 4,018 miles, and the number of motorized road and trail crossings on perennial streams would decrease from over 1,750 to 455. Permits would need to be secured prior to any in-water construction work on two proposed new perennial stream crossings, pursuant to Section 404 of the Clean Water Act (see Appendix B, design criteria for fisheries and hydrology). Stormwater permits under Section 402 would be required for construction exceeding one acre in size on trailheads or other facilities. Please refer to Table 7 for parameters further describing this alternative, and to compare this alternative to others.

This alternative would provide for a diversity of motorized uses similar to that in other alternatives. However, it would provide a lower total mileage of motorized-mixed-use roads in order to reduce the safety risk to users of non-highway-legal OHVs and motorcycles from larger vehicles on higher-speed roads. Motorized mixed use would be allowed only on Level 2 roads within concentrated motorized use areas. No motorized mixed use would be allowed between CMUAs. This means that users of non-highway-legal vehicles transiting from one CMUA to another would need to transport their vehicles using highway-legal vehicles. No motorized mixed use would be allowed on Level 3, 4 or 5 roads under this alternative in South Dakota, but such use would still be allowed on 118 miles of Level 3, 4 and 5 roads currently enrolled in the Wyoming ORV program.

Vehicles - By providing for use by both highway-legal and non-highway-legal motor vehicles, this alternative would pre-empt (not be in accord with) South Dakota State law in its current form, which requires that only highway-legal motor vehicles may use public roads. Wyoming State law provides for use of both highway-legal and non-highway-legal motor vehicles on

certain roads officially recognized (enrolled) by the State. The Forest Service would comply with Wyoming State law by enrolling all designated roads in the Wyoming program.

Table 4. Motorized recreation opportunities in Alternative D

Indicators	Alt. D	Current condition
Roads		
Miles of road open to all vehicles ***(motorized-mixed-use roads)***	580	160
Miles of road open to highway legal vehicles only ***(non-highway-legal vehicles prohibited)***	2,297	3,580
Total miles of roads	**2,877**	**3,740**
Trails		
Miles of trail open to all vehicles	112	0
Miles of trail open to vehicles 50" or less in width	181	36
Miles of motorcycle trail	21	0
Miles of special designations	6	0
Total miles of trails	**320**	**36**
Total miles of proposed motorized routes	**3,197**	**3,776**
Number of motorized-use trailheads	23	7
Area open to Motorized Cross-country Use		
Acres open to dispersed camping (motorized)	0	864,000
Acres open to game retrieval (motorized)	0	864,000
Acres open to cross-country travel (non-game retrieval)	0	864,000
Total area open to motorized cross-country travel (acres) *(Note: not additive)*	**0**	**864,000**

Vehicle Operators - It is important to understand that only users with a valid state driver's license (from any state) would be legally allowed to operate motor vehicles on the roaded portion of the motorized travel system in this alternative. Unlicensed operators could legally operate a motor vehicle only on the trail portion of the system. This would comply with applicable law in both South Dakota and Wyoming. Please refer to Table 6 for more information on vehicle and operator requirements, and motorized-mixed-use opportunities available under this alternative.

Cross-country Use - No cross-country motorized travel would be allowed in this alternative, with certain exceptions as described earlier.

A Forest Plan amendment would be required to implement this alternative. Changes to existing Forest Plan direction would take two general forms. First, where existing objectives provide quantities for road and trail mileage and cross-country area, these would be updated to conform to the quantities provided by this alternative. Second, certain standards and guidelines would be updated to conform to the Final Rule and amended regulations, to provide that motorized vehicle use would be allowed on roads, trails and areas only as shown on the motor vehicle use map or as contained in a Forest Travel Order. Refer to Appendix F for specific

changes to existing Forest Plan direction proposed under this alternative. It is anticipated that these proposed changes would constitute a minor or non-significant Forest Plan amendment.

Alternative E

This alternative represents the minimum actions needed to comply with the Travel Management Rule. It would designate the entire existing system of open roads and motorized trails and amend the Forest Plan to accommodate this system. A motor vehicle use map would be issued, designating a minimally active motorized travel system to accommodate motorized recreation desires. This alternative would not allow any motorized cross-country travel.

The intent of this alternative is to reduce implementation costs and the impacts of motorized use to natural and cultural resources, and to maximize the effectiveness of limited management resources. To a lesser degree, this alternative addresses the issues of recreational user experience and socioeconomic effects. This alternative would allow the same level and miles of motorized uses on routes near adjacent private lands as Alternative A, but would allow no motorized use in areas off designated routes. No concentrated motorized use areas (CMUAs) would be provided in this alternative.

> **Alternative E** would provide an MVUM showing the existing travel system. Alternative E would provide 160 miles of motorized-mixed-use roads and 36 miles of motorized trails. It would prohibit motorized cross-country use for any purpose, with exceptions.
>
> The MVUM would make user compliance and law enforcement easier. Resource damage, conflicts with nonmotorized recreationists and maintenance costs would be reduced. Motorized users would find a minimal planned travel system designed to meet their needs.

Alternative E would provide the same number of miles of motorized forest trails (36), and the same mileage of forest roads where motorized mixed use is allowed (160) as Alternative A (see Table 5). The number of motorized-use trailheads would remain at 7. No motorized cross-country use would be allowed for any purpose (with exceptions for emergency and administrative use as described above). Total NFS route mileage used would decrease from over 8,600 miles to 4,596 miles, and the number of motorized road and trail crossings on perennial streams would decrease from more than 1,700 to 547, as in Alternative B. No new stream crossings are proposed in this alternative. Please refer to Table 7 for parameters further describing this alternative, and to compare this alternative to others.

Vehicles - This alternative would provide for motorized mixed use (meaning use by both highway-legal and non-highway-legal motor vehicles) on a designated system of roads (primarily Level 2 with some Level 3, 4 and 5 roads) in Wyoming only. South Dakota State law requires that only highway-legal motor vehicles may use public roads. Wyoming State law provides for use of both highway-legal and non-highway-legal motor vehicles on certain roads officially recognized (enrolled) by the State. If this alternative were selected, it would comply with South Dakota State law because it would allow no motorized mixed use on public roads. It would comply with Wyoming State law because all motorized-mixed-use roads would be enrolled in the Wyoming ORV program.

Vehicle Operators - It is important to understand that only users with a valid state driver's license (from any state) would be legally allowed to operate motor vehicles on the roaded portion of the motorized travel system in this alternative. Unlicensed operators could legally

operate a motor vehicle only on the trail portion of the system. This would comply with current state law in both South Dakota and Wyoming. Please refer to Table 6 for more information on vehicle and operator requirements, and motorized-mixed-use opportunities available under this alternative.

Table 5. Motorized recreation opportunities in Alternative E

Indicators	Alt. E	Current condition
Roads		
Miles of road open to all vehicles *(motorized-mixed-use roads)*	160	160
Miles of road open to highway legal vehicles only *(non-highway-legal vehicles prohibited)*	3,580	3,580
Total miles of roads	**3,740**	**3,740**
Trails		
Miles of trail open to all vehicles	0	0
Miles of trail open to vehicles 50" or less in width	36	36
Miles of motorcycle trail	0	0
Miles of special designations	0	0
Total miles of trails	**36**	**36**
Total miles of proposed motorized routes	**3,776**	**3,776**
Number of motorized-use trailheads	7	7
Area open to Motorized Cross-country Use		
Acres open to dispersed camping (motorized)	0	864,000
Acres open to game retrieval (motorized)	0	864,000
Acres open to cross-country travel (non-game retrieval)	0	864,000
Total area open to motorized cross-country travel (acres) *(Note: not additive)*	**0**	**864,000**

Cross-country Use - No motorized cross-country travel would be allowed in this alternative, with certain exceptions as described earlier.

A Forest Plan amendment would be required to implement this alternative. Certain standards and guidelines would be updated to conform to the Final Rule and amended regulations, to provide that motorized vehicle use would be allowed on roads, trails, and areas only as shown on the motor vehicle use map or as contained in a Forest Travel Order. Refer to Appendix F for specific changes to existing Forest Plan direction proposed under this alternative. It is anticipated that these proposed changes would constitute a minor or non-significant Forest Plan amendment.

Table 6. Consistency with State traffic law, and non-highway-legal vehicle travel opportunity by alternative

Alternative	Non-hwy-legal vehicles allowed on SD public roads?*	Valid State Operator License Required?	Motorized-mixed-use road miles (non-hwy-legal use allowed)	Motorized trail miles (non-hwy-legal use allowed)	Total non-highway-legal vehicle travel mileage to designate
Original Proposed Action	No	Yes			
Alt. A	No	Yes	160 miles	36 miles	196 miles
Alt. B	Yes**	Yes	2226	663	2889
Alt. C	Yes**	Yes	2878	771	3649
Alt. D	Yes**	Yes	580	320	900
Alt. E	No	Yes	160	36	196

* In Wyoming, non-highway-legal vehicles are allowed only on roads enrolled in the State program. In Alternatives B, C and D, non-highway-legal vehicles would be allowed on all designated roads in Wyoming because they would be enrolled in the State program.

** Alternatives B, C and D would pre-empt (not conform to) South Dakota State law for vehicle registration, so non-highway-legal vehicles would be allowed on motorized-mixed-use roads. No alternative would pre-empt any State requirement for operator licensing.

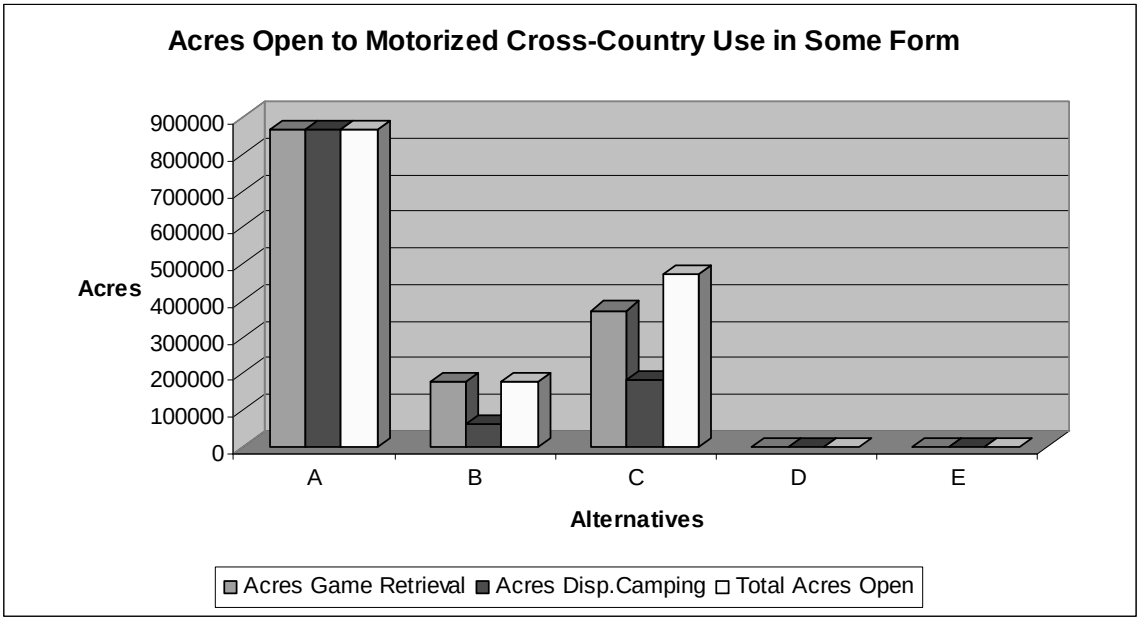

Figure 2. Acres open to motorized cross-country use under each alternative (NOTE: Cross-country travel in Alternatives B and C would be for limited purposes only)

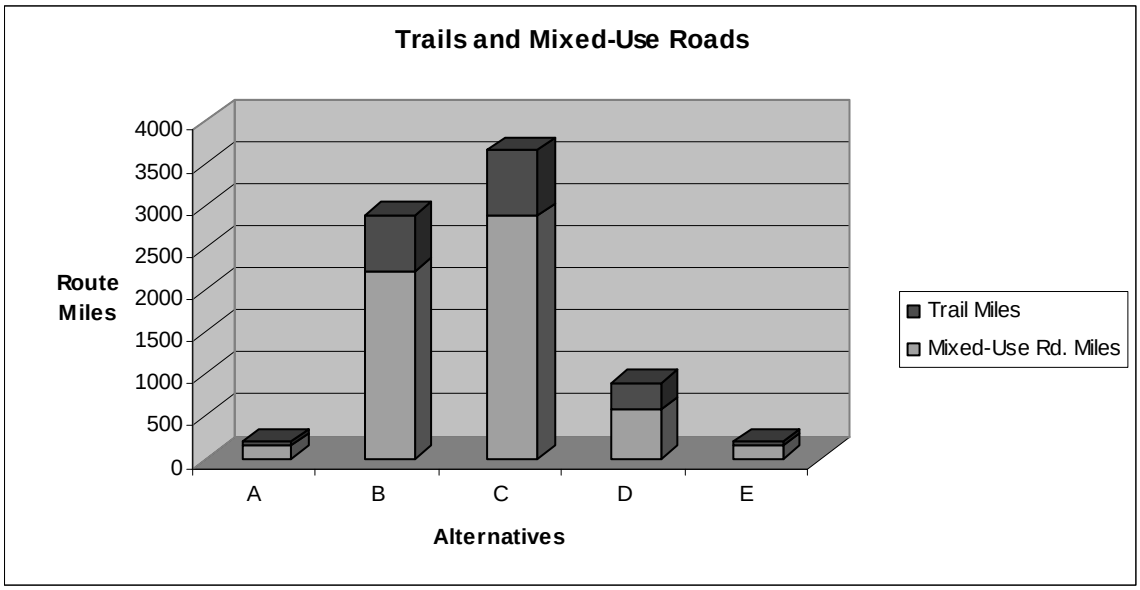

Figure 3. Miles of motorized-mixed-use routes by alternative, in terms of trails and mixed-use roads (NOTE: High current use on unauthorized routes is not reflected in this figure, but is shown as cross-country use in Figure 2)

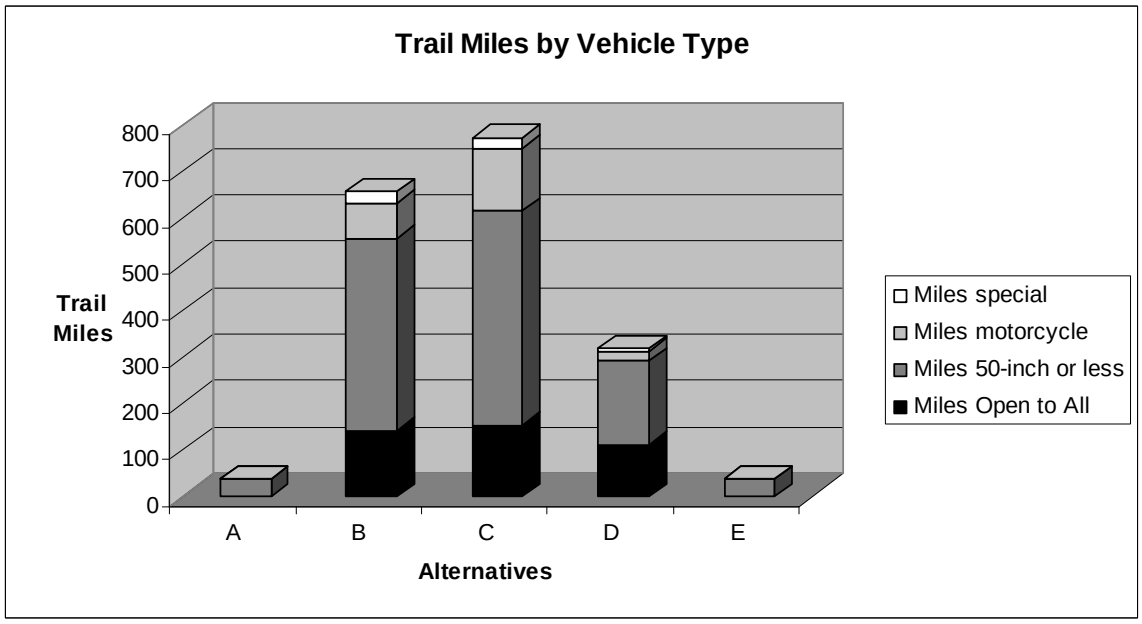

Figure 4. Trail mileage in each alternative by vehicle type

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate a range of reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods to achieve the purpose and need. Some of these alternatives may have duplicated the alternatives considered in detail; had high

potential to cause unnecessary environmental harm, or may have been outside the scope of the purpose and need. The Forest considered these other alternatives, but dismissed them from detailed consideration. Those other alternatives, and the reasons they were dismissed, are discussed below.

1) The original proposed action was evaluated and dismissed without detailed consideration. Numerous inaccuracies were found in the data, requiring corrections. Also, based on scoping comments from the public and further input from ranger district personnel, routes were added or deleted to better meet the NFAB recommendations. It became increasingly apparent that the original proposed action was obsolete, and for these reasons, it was dismissed. The modified proposed action (Alternative B) carries forward the intent of this original proposal.

2) An alternative was considered that would have allowed motorized game retrieval up to one mile, and dispersed camping up to 300 feet, from certain designated roads. Elements of this approach were suggested by several parties during scoping, including wildlife and fish management agencies from the states of South Dakota and Wyoming. The Forest Service found that a strict application of this approach would have created small isolated areas in some places that would not have been open to these activities. These isolated areas would be difficult for National Forest users and law enforcement personnel to identify, and thus would be difficult to comply with as well as to enforce. For these reasons, this alternative was dismissed from detailed consideration. However, this concept was partially adopted in Alternative C to allow motorized game retrieval in certain areas that correspond to about one mile from certain roads, and dispersed camping up to 300 feet from designated roads (see description of Alternative C on page 25.)

3) Several respondents to scoping requested that the Forest allow motorized cross-country travel on large areas. The Travel Rule allows this use of NFS lands subject to site-specific analysis. The Forest Service considered permitting such use on large areas but dismissed it from detailed consideration for several reasons. First, current relatively unrestricted motorized cross-country use has begun to have effects to natural and cultural resources that are unacceptable in some areas. The Forest Service anticipates that an increase in such use, especially if concentrated in a smaller area, could foster effects to natural and cultural resources that could become unacceptable. Allowing such effects could conflict with both the agency conservation mission and the recommendation in the NFAB Travel Management Subcommittee report that no unacceptable resource damage should occur as a result of cross-country motorized activity.

   As an alternative to unlimited motorized cross-country use, the Forest Service developed the concept of concentrated motorized use areas, or CMUAs, in which high-density motorized road and trail opportunities would be offered. While these would not provide true cross-country experiences, the Forest Service believes that these areas could meet the desires of many users for a similar experience, without the potential for incurring off-route resource damage. Motorized cross-country recreation opportunity is currently offered at other places in the Black Hills region including Railroad Buttes on the Nebraska National Forest, and several private facilities in the Spearfish, Rapid City, and Hermosa areas. Finally, this activity is included in Alternative A as part of the current condition. Limited motorized cross-country use would also be allowed under Alternatives B and C in the form of game retrieval and dispersed camping, and in Alternative C in the form of three small cross-country practice areas.

4) Various individuals and groups suggested that numerous individual routes that are not included in any of the action alternatives be opened or remain open to motorized use. Existing and proposed routes were individually evaluated by ranger district and ID Team personnel in a detailed review of routes in each district. Individual routes may have been dismissed from further consideration for one or several reasons, including: site-specific conflicts with natural or cultural resources; conflicts with other users; concerns over jurisdiction; or because they may not have fit the concept of one or more of the alternatives.

5) The Norbeck Society and other organizations suggested the original proposed action be modified in several ways. The Society recommended that additional "Walk-in Only Areas" be designated, and that any motorized trails that might affect these areas should not be considered for designation. The recommendation to designate additional "Walk-in Only Areas" was evaluated by the ID team and dismissed for several reasons. First, the purpose and need for this project is to bring the Forest into compliance with the 2005 Travel Management Rule and designate motorized routes; designation of nonmotorized routes is not the focus of this project. Second, the Forest Plan currently contains direction regarding nonmotorized trail opportunities. Regarding motorized trails that might affect these areas, the analysis in this document will consider the effects of motorized route designation on nonmotorized recreation opportunities. Finally, the Forest Service incorporated concepts in the Norbeck Society recommendation into Alternative D, and believes that the concern underlying this recommendation is addressed in that alternative.

6) The Blue Ribbon Coalition and other organizations asked the Forest Service to formulate and consider an alternative that would maximize motorized recreation opportunities. Alternative C was developed to provide a high level of motorized recreation. The Forest Service considered other alternatives that would provide even higher levels of motorized recreation opportunity. These alternatives were evaluated by the ID team and dismissed from further consideration for several reasons. First, it was found that motorized recreation at higher levels than shown in Alternative C violated Forest Plan standards for protection of resources. Second, it was found that many additional motorized routes that were considered did not enhance or fit with the concept of Alternative C. Specifically, many of these routes did not provide looped route opportunities or did not connect looped routes to form a coherent, manageable travel system. Third, some routes evaluated were found to cross other jurisdictions that would have required additional work and NEPA analysis in order to acquire easements or rights-of-way to allow public use. And finally, the addition of some proposed routes would continue or increase high sound or noise levels from motorized use near adjacent private lands.

Comparison of Alternatives

Table7 provides information related to the indicators listed for each issue in Chapter 1. Following this table is a summary narrative comparison of the alternatives that interprets information shown here. This information is derived from the more extensive analysis and discussion in Chapter 3.

Table 7. Comparison of indicator measures for the alternatives

Indicator Measure	Alternative				
	A	B	C	D	E
ISSUE 1 – Effects on Natural and Cultural Resources					
Botanical Resources					
Total miles of open NFS motorized routes	3,776	4,129	4,353	3,197	3,776
Miles of routes within 400 feet of riparian areas	2,050	2,186	2,271	1,739	2,050
Miles/acres of routes within spruce habitat	100	100	97	83	100
Miles of motorized routes in hardwood habitat	179	208	225	154	179
Wildlife Habitat Resources					
Total miles of open NFS motorized routes	3,776	4,129	4,353	3,197	3,776
Acres open to dispersed camping (motorized)	864,000	63,500	184,000	0	0
Acres open to game retrieval (motorized)	864,000	179,000	373,000	0	0
Acres open to cross-country travel (non-game retrieval)	864,000	0	0	0	0
Total area open to motorized cross-country travel (acres) (Note: acres not additive)	864,000	179,000	473,500	0	0
Miles of motorized routes in ponderosa pine habitat	2,661	2,968	3,156	2,266	2,661
Miles of motorized routes in spruce habitat	100	100	97	83	100
Miles of motorized routes in hardwood habitat	179	208	225	154	179
Miles of routes within 400 feet of riparian areas	2,050	2,186	2,271	1,739	2,050
Miles of motorized routes in grass cover type	647	673	684	562	647
Hydrology and Fisheries					
Number of motorized road and trail crossings on perennial streams	1,778	547	536	455	547
Miles of road/trail within 30 feet of a perennial stream	59	20	20	16	17
Miles of road/trail within 119 feet of a perennial stream	285	125	125	100	110
Motorized access for fisheries management and angler access	Available	No change	No change	No change	No change
Miles of motorized routes in walk-in fisheries	0.0	0.0	Less than 0.5	0.0	0.0
Soils					
Total miles of open NFS motorized routes	3,776	4,129	4,353	3,197	3,776
Acres open to dispersed camping (motorized)	864,000	63,500	184,000	0	0
Acres open to game retrieval (motorized)	864,000	179,000	373,000	0	0
Acres open to cross-country travel (non-game retrieval)	864,000	0	0	0	0
Total area open to motorized cross-country travel (acres) (Note: not additive)	864,000	179,000	473,600	0	0
Range and Noxious Weeds					
Total miles of open NFS motorized routes	3,776	4,131	4,353	3,197	3,776
Acres open to dispersed camping (motorized)	864,000	63,500	184,000	0	0
Acres open to game retrieval (motorized)	864,000	179,000	373,000	0	0
Number of motorized-use trailheads	7	31	34	23	7

Table 7. Comparison of indicator measures for the alternatives

Indicator Measure	Alternative				
	A	B	C	D	E
ISSUE 2 – Effects on Recreation Opportunities					
Forest Roads (ML 2-5)					
Miles of road open to all vehicles (*motorized-mixed-use*)	160 (WY only)	2,226 (SD & WY)	2,878 (SD & WY)	580 (SD & WY)	160 (WY only)
Miles of road open to highway legal vehicles only (not mixed-use)	3,580	1,240	704	2,297	3,580
Total miles of open NFS forest roads (*Maintenance Levels 2-5*)	**3,740**	**3,466**	**3,582**	**2,877**	**3,740**
Forest Trails					
Miles of trail open to all vehicles	0	147	154	112	0
Miles of trail open to vehicles 50 in. or less in width	36	414	460	181	36
Miles of motorcycle trail	0	76	134	21	0
Miles of special designations	0	25	22	6	0
Total miles of open NFS forest trails	**36**	**663**	**771**	**320**	**36**
Total miles of open NFS forest roads and trails	**3,776**	**4,129**	**4,353**	**3,197**	**3,776**
Miles of NFS forest roads open to public use:					
ML 2	3,083	2,827	2,939	2,241	3,083
ML 3	510	493	497	490	510
ML 4	143	142	142	142	143
ML 5	4	4	4	4	4
Total miles of open NFS forest roads, ML 2-5	**3,740**	**3,467**	**3,582**	**2,878**	**3,740**
Public road miles of other jurisdictions across NFS	820	820	820	820	820
Total miles of forest trails	36	663	771	320	36
Unauthorized route miles used on NFS lands	4,375	0	0	0	0
Total route miles used on NFS lands	**8,971**	**4,950**	**5,173**	**4,018**	**4,596**
Number of motorized-use trailheads	7	31	34	23	7
Acres open to motorized dispersed camping	864,000	63,500	184,000	0	0
Acres open to motorized game retrieval	864,000	179,000	373,000	0	0
Acres open to cross-country travel (non-game retrieval)	864,000	0	0	0	0
Total area open to motorized cross-country travel (acres) (*Note: not additive*)	**864,000**	**179,000 (limited use)**	**473,500 (limited use)**	**0**	**0**
Concentrated cross-country areas less than 5 acres		0	3 areas; 10 acres total	0	0
Affecting nonmotorized opportunity					
Miles of NFS motorized routes within ½-mile of a nonmotorized trail	318	358	382	211	318
Miles of road or trail closed to motorized use in SPNM or RNNM ROS classes	72 miles/ 333 miles	70 / 331	70 / 311	84 / 363	72 / 333

Table 7. Comparison of indicator measures for the alternatives

Indicator Measure	Alternative				
	A	B	C	D	E
ISSUE 3 – Effects of Transportation System Design on Management Capabilities					
Miles of road converted to trail (may incur higher maintenance costs)	0	207	205	146	0
Miles of ML 2 roads with motorized mixed use	49	1,914	2,537	461	48
Miles of ML 3, 4 and 5 roads with motorized mixed use	111	312	340	118	112
Total miles of ML 2-5 roads with motorized mixed use (expect higher maintenance costs from higher use levels)	**160**	**2,226**	**2,878**	**580**	**160**
Number of motorized trailheads (will incur costs to maintain, and to rehabilitate if vandalized)	7	31	34	23	7
Number of dead-end spurs less than or equal to one mile in length/miles of these spurs (may require more vigilant law enforcement patrol)	1,739 / 774 miles	1,301 / 597 mi	1,318 / 612 mi	1,035 / 463 mi	1,739 / 774 mi
Miles of NFS forest roads by maintenance level (ML):					
ML 1	1,316	1,358	1,260	2,062	1,316
ML 2	3,083	2,827	2,939	2,241	3,083
ML 3	510	493	497	490	510
ML 4	143	142	142	142	143
ML 5	4	4	4	4	4
Total miles of NFS forest roads	**5,056**	**4,824**	**4,842**	**4,939**	**5,056**
Total miles of forest trails	**36**	**663**	**771**	**320**	**36**
Total NFS forest road and trail miles to maintain	**5,092**	**5,487**	**5,613**	**5,259**	**5,092**
Unauthorized routes used on NFS lands (Not maintained, but may need rehabilitation)	4,375	0	0	0	0
ISSUE 4 – Social and Economic Concerns	**A**	**B**	**C**	**D**	**E**
Miles of designated NFS motorized routes through or within 300 feet of non-NFS lands	504	490	500	423	504
Number trailheads within 3 miles of a gateway community	0	10	11	7	0
Total miles of proposed routes open to motorized use	3,776	4,129	4,353	3,197	3,776

Comparison of Alternatives by Issue

This section briefly compares the five alternatives studied in detail in this DEIS. The alternatives are described and compared in terms of the effects each would have on the key issues described in Chapter 1. The preceding table displays comparative summaries of the effects of each alternative as well. The environmental consequences that could be expected from implementing each of the alternatives are more fully described in Chapter 3 of this document and information contained in the project file.

Issue 1 – Effects on Natural and Cultural Resources

The soil resource would see the most risk of disturbance from cross-country motorized use under Alternative A, followed by Alternatives C, B, D, and E. Reducing the area open to motorized cross-country use would also give the greatest benefit to retaining or improving vegetative productivity of the soil resource. Levels of road and trail miles open to motorized use could indirectly affect soils through more OHV parking on the edge of the road or trail, more route maintenance needed, and more time needed for recovery. Alternatives C, B, and A would have the greatest effects, with Alternatives D and E less.

Concerning hydrology and fisheries, the alternatives with the most stream crossings and roads close to streams would contribute the most sediment, but generally, all action alternatives are similar in effects to each other and would have less adverse effects than the current situation (Alternative A). Alternatives B, C, and E reduce the number of water crossings by almost 70 percent, and Alternative D by 75 percent. With respect to miles of roads and trails within 30 and 119 feet of perennial streams, Alternatives B and C reduce the mileage by over 50 percent, and Alternatives D and E by over 60 percent.

Designation of new trailheads, game retrieval, and dispersed camping would not be likely to have adverse effects on the water resource if design criteria are followed. Alternatives with more acreage open to some form of cross-country use would potentially have more effects on wetlands, with Alternative A having the most acreage open to this use. Alternatives C and B have less acreage open, respectively, and both would limit motorized cross-country use to game retrieval and dispersed camping only. Alternatives D and E would have by far the least acreage open to this use.

Wildlife habitat and species would see a net benefit from implementing any of the action alternatives due to the closing of areas to motorized cross-country travel. Alternative D would be the most beneficial, followed by Alternatives E, B, and C. The effects of motorized game retrieval in Alternatives B and C could be expected to be minor. Alternative C would have the most road and trail miles open to motorized use, and would be expected to displace wildlife more than any other alternative, followed by Alternatives B, A, E, and D.

Regarding effects to botanical and rare plant values, implementation of any of the action alternatives would be expected to have a net positive effect on native plant species in several habitat types due to the amount of area that would be closed to motorized cross-country travel. The effects of motorized cross-country game retrieval on plant species in Alternatives B and C is expected to be minor since the use would occur outside the reproductive season for most species. Alternative D would have the lowest number of route miles in hardwood habitat and within 400 feet of riparian areas, and thus show the greatest benefit; Alternatives B and C would have the highest number of route miles and show the least benefit; and Alternatives A and E would be between these. In spruce habitat, Alternative D would have the lowest number of route miles, decreasing about 17 percent from current levels; Alternatives A, B, C and E would be about equal in route mileage. All species of sensitive plants would be expected to persist in the project area if design criteria are implemented to avoid known occurrences. The action alternatives would provide a net benefit to these species by reducing or eliminating motorized cross-country travel.

With respect to **effects on the range resource, livestock grazing, and the potential for noxious weed spread,** the main indicators are total miles of road and consequent route density, and acreage open to motorized cross-country use. Alternative A contains the highest concentration of routes, including unauthorized routes, and allows unrestricted access to the greatest acreage. This contributes to matting down or removing area of vegetation, harassment of livestock, and potential for weed spread. Alternatives C, B, E, and D, in that order, would reduce the number and mileage of

motorized routes and acreage open to motorized cross-country use. Alternatives D and E would show the greatest benefits due in large part to their restrictions on motorized cross-country use.

Alternative A would have the most **effects to cultural resources** by potentially allowing motorized cross-country travel to occur on cultural resource sites without any site protection. Alternatives C and B would see less area open to cross-country travel and effects to resources, with Alternatives D and E having no area open to this use. Alternatives B, C, and D would concentrate motorized use on routes within corridors, which could increase the potential severity of impacts to resources in these areas, but this potential could be reduced by site-specific protection measures. Alternative D would have the least impacts overall by reducing the motorized route mileage and eliminating cross-country travel.

Under all alternatives, access would be provided as needed for timber and forest fuels management, fire suppression, and mineral exploration. Access for prospecting and mineral development would be provided as appropriate and necessary.

Issue 2 – Effects on Recreation Opportunities

Recreation opportunity in terms of route miles available for licensed drivers on motorized-mixed-use roads and trails, with or without vehicle registration, would be greatest under Alternative C, then B, with much less route mileage under Alternative D. Vehicle registration would be required under Alternatives A and E, with much less route mileage available. Route opportunity available to unlicensed drivers (trails only) with or without vehicle registration would be greatest under Alternative C, then B, with much less mileage under Alternative D, and less yet under Alternative E.

Motorized cross-country use for any purpose would be available only under Alternative A. Motorized cross-country use for the limited purposes of game retrieval and dispersed camping only would be allowed on less area in Alternatives C and B, with the largest area in Alternative C. Alternatives D and E would allow no motorized cross-country use for any purpose.

The Recreation Opportunity Spectrum (ROS) is used in the Forest Plan to describe recreation opportunities available in different areas of the Forest. Nonmotorized recreation opportunities are offered in areas with ROS classes of primitive (P), semi-primitive nonmotorized (SPNM), and roaded-natural nonmotorized (RNNM). Under all alternatives, 10 percent of the Forest area would continue to provide these opportunities; primitive ROS designation would be unaffected in the Black Elk Wilderness and Inyan Kara Inventoried Roadless Area; and the ROS standard in research natural areas (RNAs) would be met. The miles of road or trail closed to motorized use in areas of SPNM and RNNM classes would decrease from current levels in Alternatives B and C, representing less potential for nonmotorized route opportunity in these areas; and would increase in Alternative D, representing more potential nonmotorized route opportunity.

Nonmotorized trail opportunity across the Forest is currently 311 miles on 35 trails, with another 12 miles of the Centennial Trail shared with motorized users. This opportunity would remain the same under all alternatives. However, based on the number of miles of motorized trail within ½-mile of a nonmotorized trail, Alternative D would have by far the lowest potential for noise disturbance to nearby nonmotorized users, followed by Alternatives A and E, with Alternatives B and C about equal in higher potential to disturb nearby nonmotorized users.

Issue 3 – Effects of Transportation System Design on Management Capabilities

Travel management under any of the action alternatives would be more easily enforced by law enforcement personnel, because users not complying with the motor vehicle use map could be cited.

Many factors must be considered to estimate system costs. Alternative E would not create a motorized trail system beyond the existing roads and would be the most supportable with current funding levels. Concerning Alternatives B, C, and D, the miles of trails, number of trailheads and miles of roads to be closed would be the factors having the largest effect on long-term costs. Based on these, Alternative D would have much lower costs, with Alternative C and B the most costly, in that order.

Based on the total number of system road and trail miles, Alternative A would have the highest maintenance costs, followed by Alternatives C and B. Alternatives E and D would have the lowest costs, in that order. Increased costs of vandalism could be expected with higher numbers of trailheads. Alternatives B and C have the highest number, with Alternative D less and Alternatives A and E the lowest number.

Based on the number of miles of roads open to motorized mixed use by both highway-legal and non-highway-legal vehicles, Alternative D would be the safest, followed by Alternatives B and D, and then Alternative C.

Issue 4 – Social and Economic Concerns

Alternatives B and C are roughly equal as having the most trailheads located within 3 miles of a gateway community, followed by Alternative D. Alternatives A and E have no trailheads located within 3 miles of a gateway community. Based on the number of miles of trail within 300 feet of adjacent private land, Alternative D would have the lowest potential for noise disturbance and increased road and trail dust to neighbors. The other alternatives would all have higher potential, at about the same level.

The population in the Black Hills region, and recreational use of the Forest, would continue to grow under all alternatives. It is expected that user expectations for recreational experiences will continue to be diverse. The loss of OHV recreational opportunities from limiting or prohibiting cross-country motorized travel would be at least partially offset by the enhanced OHV trail system opportunities under Alternatives B, C, and to a limited extent Alternative D. Commercial opportunities could develop on adjacent private properties to provide cross-country areas for OHV users seeking opportunities for activities such as hill-climb, motocross, mud-bogging, or rock-crawling. None of the alternatives would be expected to create any measurable social or economic consequences on the Black Hills region.

Implementation

The Forest would use the following management strategies to implement the Travel Management Rule:

- **Motor vehicle use map production.** The motor vehicle use map would display designated routes open to wheeled motorized vehicle use. The routes would be designated open to the public by vehicle type and season of use. The map would be available to the public at no cost. The motor vehicle use map would be published annually. Based on any issues including resource impacts or enforcement changes could be made to the motor vehicle use map after its initial publication. The regulations at 36 CFR 212.57, 212.54 recognize that the designations of roads, trails and areas for motorized vehicle use are not permanent and that environmental impacts, changes in demand, route construction, and monitoring conducted under the final rule may lead responsible officials to considering revising designations. Any signage implemented on the ground would coincide with the motor vehicle use map but legal enforcement would be based on the motor vehicle use map, not on on-site signage.

Publishing a motor vehicle use map is the only legal requirement that must be met to establish and enforce the rule.

- **On-the-ground implementation.** The Forest would retain the authority to implement emergency and project level travel planning, either of which could revise designations.
- **Phased implementation.** Any alternative selected based on the analysis in this document will likely require that certain design criteria or mitigating measures be put in place prior to full implementation. As these measures identified in the analysis are completed, the associated routes will be designated on the motor vehicle use map and opened for use as appropriate.
- **Enforcement.** The Forest recognizes that enforcement would be critical to the successful implementation of the Travel Management Rule. The Forest is currently enhancing the available law enforcement staff by increasing field presence of uniformed Forest employees, Forest Protection Officers, and coordinating with other agency enforcement personnel. All Forest personnel have been directed to observe, record, and report violations of our regulations.
- **Partnerships.** The Forest would rely on partnerships to collaboratively work with Federal, State, county, and tribal agencies. The Forest would also collaborate with motorized and nonmotorized recreation user groups, conservationists and others to provide access to NFS lands on routes and in areas that are environmentally and socially sustainable. Currently, many of the Forest's motorized routes and areas are maintained and improved through cooperative relationships.
- **Public education**. The public would be provided with tools to help them access and appropriately use the designated system, including but not limited to the Travel Management home page of the Forest Internet website; the motor vehicle use map in easily usable form, hardcopy and electronic; appropriate route signing; interpretive signs on routes and at trailheads; advertisements and notices in newspapers of record; and other tools as appropriate.
- **Volunteer group participation.** The Forest would establish a trail ranger program in which volunteer groups might participate. Participating volunteer groups would (1) engage users in the management of their National Forest, (2) promote safe and responsible riding, (3) inform and educate riders about trail rules and proper land use, (4) monitor trail activity and reporting unsafe trail conditions or illegal activities, (5) perform light trail maintenance, and (6) respond to and assist trail emergencies.

Monitoring

The Travel Management Plan would be tiered to the Forest Plan desired conditions, goals and objectives and would follow (or amend) standards and guidelines. The Forest Plan monitoring strategy is designed to evaluate the achievement of desired conditions, goals, objectives, and the effectiveness of standards and guidelines.

Some monitoring questions that pertain to travel management are listed in the Forest Plan monitoring strategy (objectives 309 and 407-422). These questions would be used to determine whether travel management is being effectively managed on the Forest. Monitoring motorized use as part of the Forest's Plan is required in 36 CFR 212.57. The Forest would reference the Forest Plan monitoring strategy where appropriate. The ID team also has compiled additional monitoring needs in the project area, which are needed to validate assumptions used in this planning process, and to verify that the plan is being implemented as intended. Monitoring items will be prioritized by the responsible official if funding is not available to implement all objectives or items listed or referenced in the monitoring plan.

The stream crossing inventory protocol needs to be completed. The purpose is to find crossings not meeting current standards, to prescribe and implement rehabilitation measures to reduce impacts at these crossings. This should be completed by stream, beginning with the streams that are listed as impaired due to temperature and continuing on to the streams with the most crossings. It should be completed for the entire stream, in order to identify abandoned crossings that are no longer used. See Appendix B to the water resource specialist's report.

The effects analysis assumes that monitoring of plant occurrences will occur and that any impacts discovered will be mitigated.

Chapter 3. Affected Environment and Environmental Consequences

Introduction

This chapter describes the physical, biological, social, and economic environments of the project area and the effects of implementing each alternative on that environment. The effects analysis and disclosure presented here is tiered to the analysis presented in the Final EIS for the Revised Land and Resource Management Plan for the Black Hills National Forest (USDA Forest Service 1996a), and the Final EIS for the Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the Black Hills National Forest (USDA Forest Service 2005a).

This chapter presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2. Analysis of direct, indirect and cumulative effects of the alternatives was completed by the ID team incorporating field observations, surveys and review; aerial photography; resource modeling; literature review; past experience and professional judgment; information obtained through monitoring; Forest Plan direction and analysis; and public participation. **Direct and indirect effects** are effects that could be expected from the implementation of this project. Direct effects are those occurring at the same time and place as the initial cause or action. Indirect effects occur later in time or in a different space than the activity. Direct and indirect effects of the proposed action and alternatives were analyzed over a period extending ten years into the future, unless stated otherwise.

Cumulative effects are effects of this project when added to the effects of other actions. Cumulative effects analysis accounts for the incremental addition of direct and indirect effects of this project, added to past, present and reasonably foreseeable effects from other sources. The area analyzed for cumulative effects is the area within the Forest boundary, unless otherwise stated. The time horizon evaluated for cumulative effects analysis was generally ten years into the future, unless otherwise stated.

Past, Present, and Reasonably Foreseeable Activities

Past actions are addressed by the Council on Environmental Quality (CEQ) in the following manner: *"Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."* (CEQ Memo of June 24, 2005.) In other words, the effects of all past actions have created the current affected environment and existing condition; consequently, specific past actions do not need to be identified for the cumulative impacts analysis. In general, past actions that have taken place over the last 100 years include grazing, timber harvest, mining and exploration, recreational camping and travel, wildfires, prescribed burning, and small product removal (i.e., post and poles, and firewood).

Present actions are typically ongoing activities and are treated similarly to past actions. These activities include winter recreation such as snowmobiling and skiing; summer recreation such as hunting, dispersed camping and off-highway vehicle use; commodity uses such as gathering of fuelwood and other forest products, and livestock grazing; timber harvest and commercial fuel management, and associated road construction and reconstruction; wildfire suppression; noxious weed treatments; and other activities.

Reasonably foreseeable actions are those Forest Service actions that are formal proposals or decisions not yet implemented at the time of the analysis, and those non-Forest Service actions whose implementation is no longer speculative. Activities that add to the effects of designated travel routes include wildfires, timber harvesting, fuel reduction, livestock grazing, and recreational uses (hunting, hiking, motorized recreation, etc.). In general, it is assumed that Forest actions will continue at roughly the rate experienced over the last 10 years. It is assumed that the rate of private land subdivision and development, and the requests for access to these private parcels, will increase over what has been seen in the last 10 years.

The existing condition described in Chapter 2 for Alternative A is the baseline for the affected environment and environmental consequences that are discussed in the sections below. This existing condition includes cross-country travel and route proliferation on the Forest.

See Appendix E for a partial listing of past, present and reasonably foreseeable future activities considered in the cumulative effects analysis for this project.

General Assumptions for All Alternatives

In developing the range of alternatives, the following assumptions were used. Under any of the action alternatives:

- The public would observe and comply with the proposed transportation system. Specifically, motorized users would use only motorized routes designated on the motor vehicle use map, and would refrain from using routes not designated on that map.
- Motorized game retrieval and dispersed camping activities do not enter into or cross perennial streams.
- More areas open for motorized game retrieval would generally be expected to generate more use of these areas.
- Concentrating vehicle use to reduce effects on routes and areas not designated will increase use and possibly effects on routes and areas that are designated.

Recreation

Introduction

The analysis for the recreation resource includes all the lands within the Black Hills region of South Dakota and Wyoming. These lands could be in Federal, State, or private ownership. The analysis is largely based on information from:

- Attributes contained in GIS for roads and recreation.
- Personal knowledge of recreation resources.
- Personal experience from working with various recreation user groups.

Recreation in the Black Hills has been occurring for centuries. In the early days, activities that are considered recreational today were more of a way of life. Native Americans used the lands as hunting grounds and places to collect medicinal plants. With General Custer's expedition in 1874 came an influx of white settlers into the region in search of gold. Mining towns soon began springing up everywhere, establishing travelways that are still used today. The National Park Service established some of the first parks within and around the Black Hills, which increased tourism opportunities. These included Wind Cave National Park in 1903, Devil's

Tower National Monument in 1906, Jewel Cave National Monument in 1908, and Mount Rushmore National Park in 1927.

By 1933, the arrival of the Civilian Conservation Corps helped to improve roads, bridges, and trails to access the area and improve the resources of the region. By the 1960s, Forest managers wanted to increase tourism activities. Campgrounds, picnic areas, and other recreational infrastructure, such as cabins and hiking trails were developed to provide places for people to recreate.

Today, visitors to the Black Hills enjoy a variety of recreational opportunities such as developed and dispersed camping, picnicking, driving along scenic byways, hiking, mountain biking, horseback riding, wilderness experience, fishing and hunting, rock climbing, water-related activities, winter activities, interpretive and educational sites, fire lookout towers, and observation sites. Motorized users of the Black Hills include a variety of off-highway vehicles, such as all-terrain vehicles, utility vehicles, jeeps, and off-highway motorcycles as well as a variety of highway-legal vehicles such as passenger cars, trucks, vans, buses, motorhomes, and touring motorcycles.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Providing outdoor recreation opportunities with minimum impacts to natural resources is a primary goal in the Forest Service strategic plan (USDA Forest Service 2004). OHV use has been allowed on National Forest System lands since prior to the 1970s and is one of the fastest growing recreational activities on public lands. Two objectives of the strategic plan are to (1) emphasize improvement of public access and (2) improve the management of OHV use to protect natural resources, promote safety, and minimize conflicts among users (USDA Forest Service 2004).

Variation in State Laws for Motorized Activities - The Forest is split between two states: South Dakota (83%) and Wyoming (17%). Each State has different laws that impact the motorized travel opportunities on the Forest. In 2002, the Wyoming legislature signed into law Wyoming Statute 311-101, which resulted in a recreational program for registering OHVs on designated trails, routes, and areas. The Bearlodge Ranger District, which lies entirely in Wyoming, enrolled 24 miles of roads to be open to vehicles 50 inches wide or less (to be managed as motorized trails for public use) and about 258 miles of roads open to all vehicles. Wyoming State law allows drivers of any age on the routes designated as trails. Trails enrolled under the program require an OHV sticker, while enrolled roads require a licensed driver and the vehicle to display either an OHV sticker or license plate.

South Dakota currently does not have an OHV program. South Dakota State traffic law 32-20-12 regulates motorized opportunities on highways and roads within the Forest. Roads classified as “public roads” require licensed drivers and motor vehicles be registered; otherwise motor vehicles are allowed to operate in the outer edge of road ditches. Roads under Forest Service jurisdiction and open to motorized use are considered as public roads.

State Law for Dispersed Camping - Dispersed camping sites are widespread through the Black Hills, especially in Wyoming. The lower density of dispersed camping in South Dakota is likely due to the restriction on open fires by South Dakota State statue 34-35-15, established in 1941. Visitors recreating in South Dakota are only allowed to have campfires in developed campgrounds with established fire grills. Wyoming does not restrict open fires except by special orders during periods of extreme drought. Different user groups have developed the existing

sites based on their accessibility and the experiences they are seeking. Dispersed campsites across the Forest are occupied primarily in the summer recreation season and during the fall hunting season. Most of the campsites lie within 300 to 500 feet of open roads.

Forest Plan Direction for Recreation Opportunities - One of the goals of the Forest Plan is to provide a range of recreational opportunities. Several management aspirations are as follows: Forest trails will provide recreation opportunities for person with disabilities, hikers, mountain bikers, cross-country skiers, snowmobiles, horseback riders, ATVs, motorbikes, and four-wheel drive vehicles. Trails typically will be managed to minimize user conflicts. The trail system will link many recreation points of interest, other agency trails, and communities to provide a diverse array of recreational opportunities and travel routes. The majority of trail opportunities will be oriented towards day use with opportunities for multi-day trips on a system of interconnecting trails (USDA Forest Service 2006a).

Recreation Opportunity Spectrum Direction - The Forest Plan identified all ROS classes as guidelines with the exception of Management Emphasis Area 2.2, Research Natural Areas, in which the semi-primitive nonmotorized ROS class is a standard (USDA Forest Service 2006a).

As a Forest guideline, dispersed recreation is discouraged within 100 feet from lakes and streams unless exceptions are justified by terrain (USDA Forest Service 2006a). A Forest standard for dispersed camping within the Peter Norbeck Scenic Byway (MA 4.2A) prohibits camping within 300 feet of highways and Forest development roads, except in developed campgrounds (USDA Forest Service 2006a).

Developed recreation sites, such as trailheads, are not to be located in or immediately adjacent to known locations of R2 sensitive or plant species of local concern (USDA Forest Service 2006a).

Forest Special Orders Affecting Travel Management - An executive special order, signed on June 17, 1992, prohibits dispersed camping within the Spearfish Canyon Scenic Byway. (Executive Order 23)

Hunting - The Forest is open to public hunting for a variety of game species including turkey, elk, deer, mountain goat, and mountain lion. Mountain goat and mountain lion hunt seasons are very limited in terms of animal quota and amount of hunt time. The majority of the hunters come to the Forest for elk, turkey, and deer seasons in the fall between August and December. Below is a table indicating the number of licenses sold and animals harvested from the Forest in 2006 for elk and deer species. National Forest System lands account for the majority of public lands within the hunt areas.

Table 8. Hunting in the Forest for 2006 as represented in reports from Wyoming and South Dakota Game and Fish Departments

Location and Animal	Hunt Areas	Licenses Sold	Animal Harvests
South Dakota			
Elk	Black Hills	2,670	1,358
Deer	Black Hills	8,932	6,810
Wyoming			
Elk	1; 116	505	225
Deer	2; 4	2,619	3,566
Mule Deer	2; 4	2,619	1,124

Methodology

Recreation is a social resource in that it's based on personal interpretation. What might be considered a quality experience for one, may not necessarily apply to another. No amount of research can adequately be utilized to measure the effects on the quality of recreation someone may encounter. Research documents were reviewed to provide an understanding of how different experiences could impact recreation activities. The analysis is largely based on information from:

- Attributes contained in GIS for roads and recreation.
- Personal knowledge of recreation resources.
- Personal experience from working with various recreation user groups.

During the scoping process the public indicated that the relationship of motorized and nonmotorized recreation was one the most important issues. There is a desire for quality recreation experiences, while addressing potential conflicts between the different users. Concern was expressed regarding potential impacts to nonmotorized recreation uses including damage to trail surfaces, noise, safety, and reduction in quality of nonmotorized recreation experience due to user conflicts. Concern was also expressed regarding potential impacts between different motorized user groups.

Issues

From the public involvement, the Forest identified public concerns that should be analyzed in detail in the EIS. Three of the issue statements relate to the recreation resources:

Issue 2 - Effects on recreational opportunities. Recreational opportunities can be divided into two categories; motorized and nonmotorized. The designation of motorized opportunities, particularly the designation by vehicle class, may affect nonmotorized opportunities. With the variety of motorized vehicles on the market, recreational experiences between the motorized users could be impacted when travel routes are shared. The opportunities for motorized dispersed camping and motorized game retrieval could also be impacted as a result of designating travel routes.

Indicators

- Miles of road open to all vehicles
- Miles of road open to highway legal vehicles only
- Miles of trail open to all vehicles
- Miles of trail open to vehicles 50 inches or less in width
- Miles of motorcycle trail
- Miles of special designations (including rock crawling)
- Concentrated, cross-country travel areas less than 5 acres
- Acres open to game retrieval
- Acres open to dispersed camping
- Number of motorized trailheads

Issue 3 - Effects of transportation system design on management capabilities. How particular routes are classified for motorized-mixed-use opportunities could impact unlicensed drivers opportunities to recreate with families.

Indicator

- Miles of roads converted to trail

Issue 4 - Social and economic concerns. How the motorized travel routes are identified could impact businesses and private property.

Indicators

- Miles of designated motorized routes within 300 feet of non-Forest lands.
- Number of trailheads within 3 miles of a gateway community.

Affected Environment

The Forest is a regionally important recreation destination in South Dakota and Wyoming. The natural and cultural diversity within the rugged hills provides the basis for a wide variety of recreational activities and is vital to the area's recreation and tourism industries. Interspersed within the Forest are five National Park units including Devil's Tower National Monument and Mount Rushmore National Park. Custer and Bear Butte State Parks, Bureau of Reclamation lands, and historic towns also lie within the area.

Since the Forest is a popular recreational destination, visitors to the Forest use motorized access to a high degree. In 2004, the National Visitor Use Monitoring survey for the Black Hills estimated that 1.2 million people visit the region annually. "Driving for pleasure" was identified as one of the top five activities, and as the second highest reason people visit the Forest. In 2006, based on the survey information, the Forest Supervisor developed a marketing strategy for the Forest, "Access for the Ages", which focuses recreation opportunities on specialized campgrounds, roaded recreation opportunities and a system of trails connecting communities showcasing the user-friendly access provided by the Forest to year-round family activities. The Forest offers hundreds of miles of Federal and State highways, County roads and Forest roads, including the Norbeck and Spearfish Scenic Byways.

As stated earlier, the forest visitors enjoy a wide variety of recreation opportunities, including on- and off-road motorized use. Some motorized use is required to access most of these opportunities, no matter what the visitor's recreational preference may be.

To provide a variety of recreational experiences for the visitor, the Forest utilized a classification system referred to as Recreation Opportunity Spectrum (ROS). ROS is a planning and management tool that categorizes recreation opportunities into six settings, ranging from primitive to urban (see Glossary). The Forest Plan identified four of the six settings for its management emphasis including primitive, semi-primitive nonmotorized, semi-primitive motorized and roaded natural. The roaded natural category was further expanded to add another category called roaded natural nonmotorized to provide the Forest with additional diversity. A breakdown of acres and percent of Forest within each of the ROS classifications can be found in the table below. Within ROS classes, visitors can expect to find a variety of recreational activities, including developed and dispersed, motorized and nonmotorized opportunities.

The majority of the motorized travel system on the Forest is accessible by passenger type vehicles including cars, trucks, vans, buses, motor homes, SUVs, and touring motorcycles. Off-highway vehicles, including ATVs, jeeps, and off-highway motorcycles were sampled in the 2004 National Visitor Use Monitoring survey, but ranked only 11th (2.99%) among the 25 types of recreational activities sampled as the primary purpose for visits to the Forest.

Table 9. Black Hills National Forest ROS classes

ROS	Acres	Percent of National Forest Acres
Primitive	14,847	1.19%
Semi-Primitive Nonmotorized	36,237	2.91%
Semi-Primitive Motorized	11,996	0.96%
Roaded Natural	1,105,582	88.71%
Roaded Natural Nonmotorized	78,177	6.27%
Total	1,246,839	

Motorized recreation on the Forest can be divided into five user groups including passenger vehicles, four-wheel drive vehicles, all-terrain vehicles, utility vehicles, and off-highway motorcycles. Each group represents a different motorized need for their experience. Some prefer roads, some trails, and some prefer the freedom to traverse the forest environment. Scoping comments on the proposed action indicated that the customers of the Black Hills prefer to see a variety of motorized recreation opportunities.

In February 2008, the report, "Off-Highway Vehicle Recreation Use in the United States" was produced to identify statistical information about OHV use. A phone survey was conducted to measure participation in outdoor recreation. Nearly 92,000 people were surveyed between 1999 and 2007. The report showed a dramatic increase in retail sales nationwide of ATVs and off-highway motorcycles between 1995 (368,600 total units sold) and 2003 (8,010,000 total units sold). The report also provided data by individual states for the amount of population 16 years and older participating in an OHV program. Interestingly, Wyoming ranked highest in the nation for percentage of state population participating in OHV use, while South Dakota ranked eighth in the nation (Cordell 2008).

Environmental Effects Analysis

Direct and Indirect Effects

Alternative A – No Action

The Forest currently has 3,740 miles of NFS roads open to motorized travel yearlong or seasonally, excluding roads under other jurisdiction and 864,000 acres, (72%) of NFS lands open to off-road (cross-country) motorized travel for recreation and game retrieval. Approximately 12 miles of motorized trails exist in South Dakota, while Wyoming has designated 24 miles of closed FS system roads open to motorized vehicles 50 inches wide or less under the Wyoming OHV program. Also, in Wyoming, all NFS roads open to motorized vehicles have been enrolled in the Wyoming OHV program; thus requiring all vehicles to either be highway-legal or display an OHV sticker. Across the Forest, current management direction closes all unclassified routes to motorized use. In addition, under this alternative there is no special designation for motorcycle trails or rock crawler areas.

Motorized opportunities. The NFS roads currently open to all forms of motorized travel will continue to provide access for highway-legal vehicles for a variety of recreational activities. It is important to note that roads determined to be unclassified, without road numbers, are closed to all forms of motorized use. Many of the unclassified roads are not physically barricaded or signed as closed and have been used by the recreating public for motorized access. Unclassified

roads could occur anywhere on the Forest, including in areas open or closed to cross-country travel.

The motorized opportunity on the Forest is a shared component with all motorized users. The limited amount of motorized trails open to vehicles 50 inches wide or less means that these users are mixing with full-size vehicles on higher speed roads creating a safety concern for accidents. In an effort to avoid these conflicts, ATVs and motorcycle users usually find their own places to recreate, thus creating their own trail systems. Some of these trails are along old roads that may have been used for logging or other resource activity (unclassified roads). Some trails are illegally created from repeated use by motorized users; these can cause environmental harm if located in environmentally sensitive areas.

Motorized vehicles that are not highway legal in South Dakota will be restricted to designated trails. Roads under Forest Service jurisdiction open to motorized use will require motorized vehicles to be highway-legal and have licensed drivers. In Wyoming, vehicles that are not highway legal must have an OHV sticker under State law and must be operated by a licensed driver on National Forest roads. Family units with unlicensed drivers and non-highway-legal vehicles will be restricted to trails only. This limits families with unlicensed drivers to 12 miles of trails in South Dakota and 24 miles of trails in Wyoming.

Private land, State and other Federal ownership (non-FS) accounts for 20 percent of the acreage within the Black Hills National Forest boundary. Many landowners are concerned that the motorized activities in the Black Hills will impact their land and access; while others are concerned that they would not be able to access the designated trail system from their homes, requiring them to trailer to designated trailheads. Under Alternative A, 504 miles of Forest Service roads, 4 miles of trails, and 523 miles of other jurisdiction roads (such as County or Federal highways) would be located within 300 feet of private property and open to motorized use either seasonally or yearlong.

Cross-country travel. As a result of the continued cross-country travel opportunities, there would be continued confusion to recreation users with regards to travel management policy and restrictions. In areas where roads are closed to motorized use, but the Forest land surrounding the roads is open to motorized use, visitors are likely to utilize the closed road illegally rather than traverse the Forest.

Recreation conflicts occur when participation in one recreation activity reduces the recreation experience of another user. Conflicts are usually between motorized and nonmotorized recreationists. However, conflicts can also occur between motorized users when cross-country travel leaves unsightly damage to the land and motorized users fail to implement the “Tread Lightly” principles. User conflicts would continue to increase, under this alternative, as more motorized recreation occurs on lands with unrestricted motorized cross-country travel. Motorized recreation use is increasing and as this use increases, more people would travel cross-country in places where it is allowed. Conflict from motorized cross-country travel would be reduced when site-specific planning is completed and implemented, or when emergency closures are put into effect.

There would be no effect on people with disabilities or those people not physically fit to walk distances, because the same opportunities for motorized travel would continue to be available.

Recreation opportunity spectrum. Only 10 percent of the Forest has been designated as primitive, semi-primitive nonmotorized, or roaded natural nonmotorized ROS classes. These

ROS classes are designed to offer the public an opportunity for a quiet experience. Some of these areas have designated nonmotorized trail systems for hiking, horseback riding, or mountain biking opportunities. Others offer opportunities for the public to explore on their own. All areas have unclassified or low maintenance roads that the public is free to use for nonmotorized activities. The table below indicates the total number of miles of roads and their maintenance level that would likely be found within a semi-primitive nonmotorized or roaded natural nonmotorized area.

Table 10. Miles of road within semi-primitive nonmotorized (SPNM) and roaded natural nonmotorized (RNNM) areas

Road Type	SPNM - miles	RNNM-miles
ML 1	31	152
ML 2	23	65
ML 3	5	22
ML 4	4	6
Other jurisdiction	5	13
Unclassified/User created	42	182

Table 11. Alternative A roads or trails open or closed to motorized use within semi-primitive nonmotorized or roaded natural nonmotorized areas

	SPNM	RNNM
Roads or trails open to motorized activities	36 miles	107 miles
Roads or trails closed to motorized activities	72 miles	333 miles

Although the desired condition of these ROS classes is to offer a solitude experience, many are impacted by existing roads open to motorized activities. Of the semi-primitive nonmotorized class, only the Research Natural Areas and Fort Meade Watershed restrict or close roads to motorized use inside the boundary of ROS designation. Of the roaded natural nonmotorized class, only 5 of the 22 areas restrict motorized access inside the designated boundary. For some of the areas, such as Little Spearfish Creek, Norbeck Wildlife Preserve, or McIntosh Fen semi-primitive nonmotorized areas, access roads are main system Level 4 roads or Federal highways that provide access to other parts of the Forest. In other cases, the access roads are low-level maintenance roads that provide access to the areas or trailheads, such as Sand Creek, Lower Hell Canyon, Eagle Cliff, and Pactola Spillway. The smaller the nonmotorized area, the bigger an impact motorized access has on it. Regardless of the purpose of the road, motorized access into nonmotorized areas affects the quiet and serene experience that some visitors desire.

Continued implementation of this alternative would not be consistent with a Forest Plan guideline for ROS designation. Motorized opportunities would continue to impact the semi-primitive nonmotorized and roaded natural nonmotorized designation. The Forest Plan ROS standard for Management Emphasis 2.2, Research Natural Areas, has been achieved for all five areas by eliminating or restricting motorized access within the designated areas. The two areas identified as primitive ROS setting, Black Elk Wilderness, and Inyan Kara Inventoried Roadless Area, also meet the Forest Plan ROS guideline by restricting motorized access within their boundaries.

Table 12. Analysis indicators for Alternative A

Indicators	Unit of Measure
Miles of road open to all vehicles (motorized mixed use) Yearlong Seasonally	 148 miles 12 miles
Miles of road open to highway legal vehicles only Yearlong Seasonally	 2,924 miles 656 miles
Miles of trail open to all vehicles Yearlong Seasonally	 0 miles 0 miles
Miles of trail open to vehicles 50 inches or less in width Yearlong Seasonally	 12 miles 24 miles
Miles of motorcycle trail Yearlong Seasonally	 0 miles 0 miles
Miles of special designation (rock crawling) Yearlong Seasonally	 0 miles 0 miles
Concentrated, cross-country travel areas less than 5 acres	0 areas
Acres open to motorized cross-country travel	864,000 acres
Acres open to motorized game retrieval	864,000 acres
Acres open to motorized dispersed camping	864,000 acres
Number of motorized trailheads	7 trailheads
Miles of roads converted to trail	0 miles
Miles of designated motorized routes within 300 feet of non-Forest lands	504 miles
Number of trailheads within 3 miles of a gateway community	0 trailheads

Dispersed camping. Motorized dispersed camping would continue to occur anywhere on the Forest with minimal restrictions with the exception of the Norbeck area, wilderness, research natural areas, and Spearfish Canyon.

Game retrieval. The greatest impact to hunters occurs when motorized vehicles access areas designated nonmotorized. Under this alternative, with 72 percent of the Forest's land base open to cross-country travel, big game hunters have many opportunities to utilize any motorized vehicle to retrieve their harvests for any game species, including turkey, elk, deer, mountain lion, and mountain goat. For the nonmotorized hunter, 28 percent of the National Forest System land area is restricted for motorized access.

When motorized hunters impact the nonmotorized areas during hunting seasons, it affects those hunters whose methods of accessing, scouting, stalking, and retrieving are by foot or horse. To some extent, even in open cross-country areas, those motorized hunters who stay on roads and trails can be affected by hunters who travel cross-country. Their hunting experience may be reduced or spoiled by others using motorized vehicles to travel cross-country to scout for game, access favorite hunting areas, and drive or chase game for a better shot or to retrieve game. For many, the noise created by motorized vehicles diminishes the hunting experience because it disturbs and displaces game animals from the immediate area. The effects are more pronounced where motorized cross-country use is more common, such as on flatter or more open terrain. Fewer hunters are affected in the heavily timbered and or steeper areas where there is less

opportunity for motorized cross-country travel, or in areas currently closed to cross-country travel.

Continued forest management activities, such as timber harvesting or prescribed burning, can also displace game species and affect a successful hunt. Some hunters have complained that if an area of the Forest restricts motorized access, it should restrict that access to all, including Forest managers and its contractors and permittees.

Alternative B - Modified Proposed Action

This alternative proposed a total of 4,129 miles of motorized opportunities on roads and trails be designated yearlong or seasonally for all types of vehicles. Motorcycle trails would account for 76 miles, while trails 50 inches wide or less would account for 414 miles. Twenty-five miles of routes would be designated as special designation for rock crawling areas. Most seasonal designation of trails and roads would overlap with snowmobile trails or big game habitat areas. Dispersed camping would be restricted to within 100 feet of designated roads only, while game retrieval would be restricted to 300 feet off of designated routes for retrieval of elk only.

Motorized opportunities. The proposed routes for motorized designation consist mostly of a variety of roads. Those using passenger type vehicles would not experience any change in access to developed sites or recreational trailheads. Users desiring off-road opportunities would experience changes with the closure of cross-country travel and the limitation to designated routes. Motorized users who desire challenging experiences they previously found with cross-country travel may find a road-based system dull and not challenging enough. The relatively few designated rock-crawling areas identified under this alternative may become over-run as users look to these areas to fulfill the challenging rides they once experienced through cross-country travel. The increased use of these areas may result in higher maintenance needs and eventually lead to closure if resource damage becomes too great.

To provide the desired trail experience, some roads would be restricted to vehicles 50 inches wide or less to reduce conflicts with larger vehicles. These roads have grass or native surfaces rather than gravel and can provide for a narrower trail experience that some visitors prefer if managers choose to limit maintenance along the road to a 50-inch width. Over time, these routes would narrow as vegetation naturally encroaches on the road. However, if these routes are needed for future management activities, such as logging activity, the trail experience would be lost at least temporarily as the roads are reconstructed to a wider width to accommodate logging vehicles. In Wyoming, these trail areas would require an OHV sticker and be open to drivers of any age to operate vehicles 50-inches wide or less, while in South Dakota these areas would be available for both highway-legal and non-highway-legal vehicles.

Although there would be more opportunities for motorized recreation for vehicles 50 inches wide or less as a result of restricting motorized access on some NFS roads under this alternative, conflicts between motorized users would continue to occur on all designated routes. Also, conflicts between management activities and motorized users could occur on routes designated as trails if administrative use of these routes allows access by full size vehicles. Safety concerns for head-on collisions, particularly along blind corners, could occur on any road designated for motorized use between full-size vehicles and vehicles 50 inches wide or less. Another conflict between motorized users exists when ATVs access motorcycle trails. Please refer to the Engineering section in this document for further discussion of safety of motorized mixed uses on roads and trails.

Due to the purpose for which many roads were constructed or established, it is likely that the motorcycle trails have sufficient width to accommodate ATVs. Over time, ATVs create two tracks, which could make it difficult for single-track vehicles (motorcycles) to negotiate the trail. Since the designated system consists mostly of roads that were designed for management activities, the recreating public may be impacted by logging traffic, road equipment, fire equipment, etc., as the Forest continues to manage the resources of the land. Some routes may be closed temporarily to reduce user conflicts and safety hazards until management activities are completed. These temporary closures would displace motorized user to other locations, which could increase resource impacts and possibly damage.

Under this alternative, more opportunities exist for non-highway-legal vehicles to traverse the designated system. Any route identified open to all motorized use would be open to non-highway-legal vehicles for South Dakota only; Wyoming would still require non-highway-legal vehicles to display an OHV sticker. State law still applies for both states, in that drivers are required to carry a driver's license when operating on public roads. Designated trails will offer the only opportunities for unlicensed drivers to travel. Family units with unlicensed drivers would likely enjoy the motorized opportunities designed in this alternative. This alternative offers 638 miles of trails and 2,226 miles of roads open to a variety of motorized use either yearlong or seasonally.

For private, State, and other (non-FS) Federal ownership lands, this alternative accounts for 490 miles of Forest Service roads, 30 miles of trails, and 523 miles of other jurisdiction roads (such as County or Federal highways) located within 300 feet of private property open to motorized use either seasonally or yearlong.

Trailheads. Thirty-one trailheads have been identified for this alternative to provide parking opportunities. Of these, only 10 are within 3 miles of communities that offer amenities such as hotels, gas stations, and restaurants.

Recreation opportunity spectrum. As compared with Alternative A, Alternative B would open additional roads to motorized opportunities inside areas with ROS settings for nonmotorized activities. For semi-primitive nonmotorized areas, three areas – Dugout, Cook Lake, and Sundance Burn – would have roads open to motorized use. On the other hand, Beaver/Bear Gulch and Norbeck Wildlife Preserve would see roads closed to motorized use. All other semi-primitive nonmotorized areas remain unchanged from Alternative A. Both Cook Lake and Dugout would offer opportunities to connect motorized trails 50 inches wide for looping opportunities, while Sundance Burn would identify a trail to an overlook. Overall, this alternative would open 3 miles of new routes to motorized use within semi-primitive nonmotorized areas.

Of the roaded natural nonmotorized areas, Bogus Jim, Smith Draw, Eagle Cliff, Forbes Gulch, and Wood Canyon would see new roads opened to motorized use. Forbes Gulch would have approximately 6 miles of motorized trail designated open to all vehicles by special permit only for motorized events. Smith Draw, Wood Canyon, and Bogus Jim would see an increase in motorized use through designation of trails open to vehicles 50 inches wide or less or motorcycles, while Black Fox, Lower Rapid Creek, Battle Creek, Swede Gulch, Pactola Spillway, Buckhorn/Bear Gulch, and Big Game Resource Production would see reductions in motorized access by the closing of open roads. Overall, this alternative would open 3 miles of new routes to motorized use within roaded natural nonmotorized areas.

Table 13. Alternative B roads or trails open or closed to motorized use within semi-primitive nonmotorized or roaded natural nonmotorized area

	SPNM	RNNM
Roads or trails open to motorized activities	38 miles	109 miles
Roads or trails closed to motorized activities	70 miles	331 miles

This alternative would not be consistent with a Forest Plan guideline for ROS designations in that motorized opportunities would continue to impact the semi-primitive nonmotorized, and roaded natural nonmotorized designations. The Forest Plan ROS standard for Management Emphasis 2.2, Research Natural Areas, has been achieved for all five areas. The two areas identified as primitive ROS setting are Black Elk Wilderness and Inyan Kara Inventoried Roadless Area, which would also meet the Forest Plan ROS guideline by restriction of motorized access within their boundaries.

Table 14. Analysis indicators for Alternative B

Indicators	Unit of Measure
Miles of road open to all vehicles (motorized mixed use) Yearlong Seasonally	 1,638 miles 588 miles
Miles of road open to highway legal vehicles only Yearlong Seasonally	 991 miles 249 miles
Miles of trail open to all vehicles Yearlong Seasonally	 95 miles 52 miles
Miles of trail open to vehicles 50 inches or less in width Yearlong Seasonally	 142 miles 272 miles
Miles of motorcycle trail Yearlong Seasonally	 75 miles 1 miles
Miles of special designation (rock crawling) Yearlong Seasonally	 13 miles 12 miles
Concentrated, cross-country travel areas less than 5 acres	0 areas
Acres open to motorized cross-country travel	0 acres
Acres open to motorized game retrieval – 300 feet	179,000 acres
Acres open to motorized dispersed camping – 100 feet	63,500 acres
Number of motorized trailheads	31 trailheads
Miles of roads converted to trail	207 miles
Miles of designated motorized routes within 300 feet of non-Forest lands	490 miles
Number of trailheads within 3 miles of a gateway community	10 trailheads

Cross-country travel. This alternative would eliminate recreational experiences associated with cross-country driving. Recreation conflicts associated with cross-country travel would also be eliminated. Over time, illegally created trails within open cross-country areas would revegetate.

Motorized users desiring the experience of cross-country travel may find other areas to recreate on neighboring lands including the Railroad Buttes motorized use area.

Most National Forest System lands would still be accessible to some degree by motorized vehicles under this alternative as the road and trail network is generally dense enough that people would not have to walk more than a mile to reach a road or trail. Some people may view these changes as a loss of recreation opportunity. Restricting motorized cross-country travelers to roads and trails would have little to no effect on motorized visitors who only use roads and trails now.

Dispersed camping. Dispersed camping would be restricted to 100 feet off of designated roads, although not all areas along designated roads are suitable for dispersed camping due to topography and vegetation. This could result in campsites being very close to motorized roads. Dust and noise from adjacent roads could impact campsites. No motorized dispersed camping would be allowed from any designated motorized trail. Therefore, dispersed campers desiring more distance off a road would be displaced. For Alternative B, the current management direction that restricts motorized dispersed camping would be the same as Alternative A.

Game retrieval. Off-road motorized game retrieval opportunities under this alternative would be restricted to 300 feet for elk season only off of designated routes. Limiting motorized hunters to this specific distance for elk retrieval only would reduce the conflicts between motorized and nonmotorized hunters, but could create more illegal road hunting problems for game enforcement officers. Under Alternative B, motorized hunters would not be allowed to scout for game, access favorite hunting areas, and drive or chase game for a better shot and retrieve game.

Alternative C

This alternative proposes a total of 4,353 miles of motorized opportunities on roads and trails that would be designated yearlong or seasonally for all types of vehicles. Motorcycle trails would account for 134 miles, while trail 50 inches wide would account for 462 miles. Twenty-three miles of routes would be designated as special designation for rock crawling areas. Most seasonal designation of trails and roads would overlap with snowmobile trails or big game habitat areas. In addition to the designation of roads and trails, three small areas, less than 5 acres each, would be set up as learning areas. Dispersed camping would be restricted to within 300 feet of designated roads only, while game retrieval would be allowed in a designated area of about 373,000 acres open for cross-country retrieval of downed elk or deer.

Motorized opportunities. This alternative would designate more routes open to all vehicles, thus giving all vehicle types more access to the Forest. Family units or motorized clubs that may have both UTVs (utility terrain vehicles) and ATVs would be able to travel together on more routes, with the exception of trails open to vehicles 50 inches or less in width. However, all motorized users would be competing for access along routes, thus possibly increasing conflicts between motorized user groups. Some routes may not be wide enough to accommodate passage of two vehicles and additional safety concerns could result. Please refer to the Engineering section of this document for further information on safety implications of the alternatives. Passenger type vehicles would not experience any change in access to developed sites or recreational trailheads.

As with Alternative B, the designated system of Alternative C would consist mostly of roads that were originally designed for management activities. As the Forest continues to manage the resources of the land, the recreating public could be impacted by logging traffic, road equipment,

fire equipment, etc. Some routes may be closed temporarily for public safety until management activities are completed. These temporary closures would displace motorized users to other locations, which could increase resource impacts and possibly resource damage.

Under this alternative, opportunities for motorized travel would increase for highway-legal and non-highway-legal vehicles. Any route identified open to all motorized use would be open to non-highway-legal vehicles for South Dakota only; Wyoming would still require non-highway-legal vehicles to display an OHV sticker. State law would still apply for both states, in that drivers would be required to carry a driver's license when operating on public roads. Designated trails would offer the only opportunities for unlicensed drivers to travel. Family units with unlicensed drivers would find this alternative more accommodating with the addition of trails to explore with their children. This alternative would offer 749 miles of trails and 2,878 miles of roads open to a variety of motorized use either yearlong or seasonally.

For private, State, and other Federal ownership lands, this alternative accounts for 500 miles of Forest Service roads, 32 miles of trails, and 523 miles of other jurisdiction roads (such as County or Federal highways) located within 300 feet of private property open to motorized use either seasonally or yearlong.

Trailheads. Thirty-four trailheads would be identified in this alternative to provide parking opportunities. Of these 34 trailheads, only 11 would be within 3 miles of communities that offer amenities such as hotels, gas stations, and restaurants.

Recreation Opportunity Spectrum. Alternative C would have more impacts to the nonmotorized ROS classes than Alternative B due to additional routes proposed for motorized access. Some nonmotorized areas have been improved through new motorized road closures while others have increased motorized opportunities. The greatest new motorized access would occur in the Smith Draw roaded natural nonmotorized, Sundance Burn semi-primitive nonmotorized, and Lower Rapid Creek and Pactola Spillway roaded natural nonmotorized areas. Alternative C would open 3 miles of new routes to motorized use as compared with Alternative A. For the roaded natural nonmotorized, this alternative would open 22 miles of new routes to motorized use.

Table 15. Alternative C roads or trails open or closed to motorized use within semi-primitive nonmotorized or roaded natural nonmotorized areas

	SPNM	RNNM
Roads or trails open to motorized activities	38 miles	129 miles
Roads or trails closed to motorized activities	70 miles	311 miles

This alternative would not be consistent with a Forest Plan guideline for ROS designations in that motorized opportunities would continue to impact the semi-primitive nonmotorized and roaded natural nonmotorized designations. The Forest Plan ROS standard for Management Emphasis 2.2, Research Natural Areas would be achieved for all five areas. Two areas identified as primitive ROS setting are Black Elk Wilderness and Inyan Kara Inventoried Roadless Area. Black Elk Wilderness and Inyan Kara would also meet the Forest Plan ROS guideline by restricting motorized access within their boundaries.

Cross-country travel. As with Alternative B, this alternative would close the Forest to cross-country travel. Users desiring off-road opportunities would be limited to designated routes. Those who desire challenging experiences typical of cross-country travel may find a road-based system dull and not challenging enough. The few designated rock-crawling areas identified under this alternative could become over-run as users look to these areas to fulfill the challenging rides they once experienced through cross-country travel. The increased use of these areas may result in higher maintenance and eventually lead to closure if resource damage becomes too great.

To accommodate beginning motorized users, three areas would be provided as training areas. These areas would be small in scale, less than 3 acres, but would provide sufficient room to learn to operate an off-highway vehicle in a controlled setting. The effects of designating only three areas could create problems for managers if this activity is highly desired by the public, and users could soon overwhelm the small areas, resulting in conflicts between users and potential safety concerns. As use increased in these areas and track patterns become set, racetracks could ultimately develop.

Dispersed camping. Under this alternative, motorized dispersed camping would be restricted to 300 feet off of designated routes only. Not all areas along designated routes may be suitable for dispersed camping due to topography and vegetation. The increased distance, as compared with Alternative B, would allow additional space for users to pull off the motorized road and reduces the impacts from dust and noise related to camping on the edge of a road. Most dispersed campsites in the Forest are within 300 feet of a designated motorized road. Those campsites that are further away would be closed for use and rehabilitated.

Game retrieval. During the initial scoping period for this project, South Dakota Game, Fish and Parks Department offered an alternative to the proposed action of designating a distance of up to one mile either side of any motorized road or trail for big game retrieval. The Forest Service reviewed this proposal, and determined it would result in little or no change from the current condition of the Forest, thus the proposal was eliminated from further consideration.

However, the Forest Service developed Alternative C, which would designate an area for off-road motorized game retrieval on approximately 373,000 acres (31%) of the Forest. This area is considerably smaller than Alternative A, but would allow unrestricted off-road game retrieval opportunities for the motorized hunter during elk and deer season only (September to December) for South Dakota and Wyoming. The designated area proposed in this alternative has traditionally been open year-round to cross-country travel and would not likely create any new effects to the nonmotorized hunter. There is no data available to determine how many Black Hills hunters are motorized users, and it is possible that this smaller area could be heavily impacted, creating the potential for an increase in hunting accidents. However, it is likely that the designated area would continue to see management complications in areas where roads are closed to motorized use, but the land area is open to off-road motorized game retrieval since this is the case with the current management (see Alternative A discussion under cross-country travel). Only hunters would be allowed to travel off-road for game retrieval of downed animals. No recreational off-road travel would be allowed in this alternative.

Outside of the designated off-road motorized game retrieval area, the density of motorized routes proposed would be relatively high allowing good access to the Forest. This alternative would require that animals harvested be dragged to a designated motorized route from as little as a half-mile to two miles distant, depending on the hunt area.

Table 16. Analysis indicators for Alternative C

Indicators	Unit of Measure
Miles of road open to all vehicles (motorized mixed use) Yearlong Seasonally	 1,956 miles 922 miles
Miles of road open to highway legal vehicles only Yearlong Seasonally	 634 miles 70 miles
Miles of trail open to all vehicles Yearlong Seasonally	 91 miles 63 miles
Miles of trail open to vehicles 50 inches or less in width Yearlong Seasonally	 191 miles 269 miles
Miles of motorcycle trail Yearlong Seasonally	 109 miles 25 miles
Miles of special designation (rock crawling) Yearlong Seasonally	 9 miles 13 miles
Concentrated, cross-country travel areas less than 5 acres	3 areas
Acres open to motorized cross-country travel	0 acres
Acres open to motorized game retrieval – designated area	373,000 acres
Acres open to motorized dispersed camping – 300 feet	184,000 acres
Number of motorized trailheads	34 trailheads
Miles of roads converted to trail	205 miles
Miles of designated motorized routes within 300 feet of non-Forest lands	500 miles
Number of trailheads within 3 miles of a gateway community	11 trailheads

Alternative D

This alternative proposes a total of 3,197 miles of motorized opportunities on roads and trails to be designated yearlong or seasonally for all types of vehicles. Motorcycle trails would account for 21 miles, while trails of 50 inches or less would account for 181 miles. Six miles of routes would be designated as special designation for rock crawling areas. Most seasonal designation of trails and roads would overlap with snowmobile trails or big game habitat areas. No dispersed camping or game retrieval would be allowed under this alternative. Vehicles that are not highway legal would be restricted in South Dakota to concentrated motorized use areas (CMUAs); whereas in Wyoming, these vehicles would be required to purchase a State OHV sticker to ride designated roads and trails.

Motorized opportunities. Reduction of motorized access would concentrate motorized use into smaller areas, which could create additional environmental impacts and more conflicts between motorized users. The biggest reduction of motorized access would be seen on routes designated as trails for ATV and motorcycles, and special designated areas such as rock crawlers. As with the above alternatives, passenger type vehicles would continue to have access to popular recreation places such as campgrounds and picnic areas.

With the reduction of motorized trail opportunities, users would share motorized routes similar to Alternative A. Highway-legal ATVs and UTVs would be able to travel the same routes as full

size vehicles, thus creating the same conflicts between motorized user groups as the other alternatives. Motorcycle users would see their trail experience opportunity reduced to less than 21 miles. The repeated use of these 21 miles could create additional rutting and possibly resource damage. Rock crawlers would also see increased use in their areas as users looking for challenges would be concentrated on 6 miles of designated trails.

The smaller number of trail opportunities relative to other alternatives would concentrate management activities and recreating public into smaller areas. Impacts from vehicle traffic associated with management activity could also increase road closures to the public for safety reasons and further concentrate motorized recreation, particularly for the non-highway legal vehicles, which could increase resource impacts and resource damage.

For this alternative, public safety was given additional consideration. Vehicles that are not highway legal would be restricted in South Dakota to only trail systems and a few designated roads that connect the trails. As with Alternatives B and C, any route identified open to all motorized use would be open to highway-legal and non-highway-legal vehicles for South Dakota only; while Wyoming would still require non-highway-legal vehicles to display an OHV sticker. State law would still apply for both states, in that drivers would be required to carry a driver's license when operating on public roads. Designated trails would offer the only opportunities for unlicensed drivers to travel. This alternative would offer 314 miles of trails and 580 miles of roads open to a variety of motorized use either yearlong or seasonally.

For South Dakota, seven concentrated motorized use areas were designed to provide non-highway legal vehicles a place to recreate. Some areas provide a good day's ride (perhaps about 40 to 60 miles of interconnecting routes) while others are small (perhaps several miles to about 20 miles of routes). These smaller areas may provide beginners opportunities to learn to ride; however, experienced riders will soon become bored with the short distances. There are also many dead end routes and trails that will require users to traverse back to the beginning. None of the CMUAs are linked together with trails or routes, forcing non-highway-legal motorized users to use trailers between the areas.

Not all the routes designated open to non-highway-legal vehicles have designated trailheads, so users will be required to park on the roadsides in order to access the route. Continual use of these routes may create resource damage from repeated roadside parking. Competition between users, highway legal and non-highway legal, to access this limited area is expected to be high since these areas offer trail opportunities rather than roads to ride. Trails offer a more narrow experience that most motorized riders desire.

For private, State, and other (non-FS) Federal ownership lands, this alternative would account for 423 miles of Forest Service roads, 22 miles of trails, and 523 miles of other jurisdiction roads (such as County or Federal highways) located within 300 feet of private property open to motorized use either seasonally or yearlong. Under this alternative with more routes identified as open to highway legal only, landowners would be required to license their recreational vehicles to travel from their homes or trailer their non-highway-legal vehicles to designated trailheads.

Trailheads. Twenty-three trailheads would be identified for this alternative to provide parking opportunities. Of these, only 7 would be located within 3 miles of communities that offer amenities such as hotels, gas stations, and restaurants. In addition, since non-highway-legal vehicles would be restricted to trail areas, only 14 trailheads would be connected to the designated trail system, while the others are connected to highway-legal-only roads.

Recreation Opportunity Spectrum. Under this alternative, alignment of motorized travel with ROS nonmotorized classes would be improved considerably over Alternative A; however, where other jurisdiction roads or FS maintenance level 3, 4, or 5 coincide with nonmotorized areas the potential for motorized conflict would still exist. As compared with Alternative A, no additional routes would be open for motorized use and new road closures are proposed for 12 miles and 30 miles in semi-primitive nonmotorized and roaded natural nonmotorized, respectively. In addition to closures inside designated ROS nonmotorized classes, some roads outside these boundaries would also be closed to motorized use, thus providing more nonmotorized experience.

Table 17. Alternative D roads or trails open or closed to motorized use within semi-primitive nonmotorized or roaded natural nonmotorized areas

	SPNM	RNNM
Roads or trails open to motorized activities	24 miles	77 miles
Roads or trails closed to motorized activities	84 miles	363 miles

This alternative would not be consistent with a Forest Plan guideline for ROS designations in that motorized opportunities would continue to impact the semi-primitive nonmotorized and roaded natural nonmotorized designation. The Forest Plan ROS standard for Management Emphasis 2.2, Research Natural Areas, would be achieved for all five areas. The two areas identified as primitive ROS setting, Black Elk Wilderness and Inyan Kara Inventoried Roadless Area, would also meet the Forest Plan ROS guideline by restricting motorized access within their boundaries. This alternative would offer the best opportunities for the solitude experience desired by nonmotorized users as routes proposed for new closures extend outside of many of the nonmotorized ROS classes.

Cross-country travel, dispersed camping, and game retrieval. This alternative would restrict motorized use to designated routes only and would offer no off-road opportunities anywhere on the Black Hills for any recreation purpose. Cross-country travel effects are similar to above alternatives. Users desiring a more rugged means of travel may find the rock crawling areas to their satisfaction. However, the reduction in rock crawling areas under this alternative would tend to concentrate users, creating additional motorized conflicts as motorized users try to experience their desired activity.

The prohibition of motorized dispersed camping would be greatly felt during the fall hunting season within both states. The Black Hills has hundreds of dispersed campsites along roads that are currently open to motorized vehicles during deer and elk hunting seasons. These campsites provide the hunter easy access to their desired hunting grounds. Without this dispersed camping opportunity, hunters might utilize developed campgrounds creating overflow situations and increases in maintenance and resource damage.

Dispersed camping by recreationists during the summer would be impacted more in Wyoming than South Dakota since the latter state has a ban on open fires. Many visitors who camp during the summer in Wyoming are in large groups of 4 to 8 campers, and tend to be family units. The opportunity to dispersed camp currently allows these groups to be louder than would be acceptable in developed campgrounds, and to have a larger campfire for a group setting. Under this alternative, these groups might also seek out developed campgrounds, thus creating conflicts with other campers.

The prohibition on motorized off-road game retrieval would limit access for hunters. Hunters would have to use existing motorized roads and trails for game retrieval, which could create more road hunting situations for game enforcement officers. Depending on the location of the hunt, hunters might have to drag their animal from one-half mile to two miles to the nearest motorized route. Hunters incapable of this physical activity might have to find alternative means, such as outfitters, horses, etc., to get their downed animal to a motorized route.

Table 18. Analysis indicators for Alternative D

Indicators	Unit of Measure
Miles of road open to all vehicles (motorized mixed use)	
Yearlong	315 miles
Seasonally	265 miles
Miles of road open to highway legal vehicles only	
Yearlong	1,936 miles
Seasonally	361 miles
Miles of trail open to all vehicles	
Yearlong	67 miles
Seasonally	45 miles
Miles of trail open to vehicles 50 inches or less in width	
Yearlong	88 miles
Seasonally	93 miles
Miles of motorcycle trail	
Yearlong	21 miles
Seasonally	0 miles
Miles of special designation (rock crawling)	
Yearlong	3 miles
Seasonally	3 miles
Concentrated, cross-country travel areas less than 5 acres	0 areas
Acres open to motorized cross-country travel	0 acres
Acres open to motorized game retrieval	0 acres
Acres open to motorized dispersed camping	0 acres
Number of motorized trailheads	23 trailheads
Miles of roads converted to trail	146 miles
Miles of designated motorized routes within 300 feet of non-Forest lands	423 miles
Number of trailheads within 3 miles of a gateway community	7 trailheads

Alternative E

This alternative proposes the same designated motorized system as Alternative A, but would eliminate all motorized opportunities for dispersed camping and game retrieval. A total of 3,776 miles of motorized routes and trails, seasonally or yearlong, would be available for all types of vehicles. Of this, only 36 miles would be designated as trails open to vehicles 50 inches or less in width, and no trails would be designated for motorcycle or rock crawler opportunities.

Motorized opportunities and recreation opportunity spectrum. Under Alternative E, since the motorized routes are the same as Alternative A, effects to motorized opportunities and ROS would be the same as those under Alternative A.

Cross-country travel and dispersed camping, and game retrieval. Alternative E proposes no cross-country travel, no motorized dispersed camping, and no off-road motorized game retrieval. Effects to these recreation opportunities would be the same as those under Alternative D.

Table 19. Analysis indicators for Alternative E

Indicators	Unit of Measure
Miles of road open to all vehicles (motorized mixed use) Yearlong Seasonally	 148 miles 12 miles
Miles of road open to highway legal vehicles only Yearlong Seasonally	 2924 miles 656 miles
Miles of trail open to all vehicles Yearlong Seasonally	 0 miles 0 miles
Miles of trail open to vehicles 50 inches or less in width Yearlong Seasonally	 12 miles 24 miles
Miles of motorcycle trail Yearlong Seasonally	 0 miles 0 miles
Miles of special designation (rock crawling) Yearlong Seasonally	 0 miles 0 miles
Concentrated, cross-country travel areas less than 5 acres	0 areas
Acres open to motorized cross-country travel	0 acres
Acres open to motorized game retrieval	0 acres
Acres open to motorized dispersed camping	0 acres
Number of motorized trailheads	7 trailheads
Miles of roads converted to trail	0 miles
Miles of designated motorized routes within 300 feet of non-Forest lands	504 miles
Number of trailheads within 3 miles of a gateway community	0 trailheads

Cumulative Effects

The cumulative effects area for the recreation resource includes other public lands, including those managed by the Bureau of Land Management, the States of South Dakota and Wyoming, National Park Service, Buffalo Gap National Grasslands, and Thunder Basin National Grasslands, and private properties within 2 hours drive of the Forest.

As the Federal Travel Management Rule is implemented on National Forest System lands, a reduction in cross-country motorized travel will occur on these lands. New motor vehicle restrictions imposed on Thunder Basin and Buffalo Gap would also displace motorized users that desire this type of riding under Alternatives B, C, D, and E. Areas that might be designated on these lands under future travel management decisions could become overrun with motorized users, increasing resource impacts and management concerns. Other Federal properties could also see an increase in motorized use if cross-country travel is made available. Users who till now have had the freedom to choose their own routes to ride could find it difficult to adapt to the new designated system. Some public lands could provide only a small mileage of motorized trails or roads, causing motorized users to relocate to find more opportunities.

Under all alternatives, designated routes that dead-end may be points for creation of illegal trails, which would pose additional burdens on law enforcement and cause resource damage. These illegal trails could increase the need for additional restrictions or closures for motorized use, and thus reduce motorized opportunities even more over time. However, it is also likely that as the designated motorized system is implemented over the next several years, new routes could be added to connect these dead-end routes and improve looping opportunities for users. Additional environmental analysis through vegetation management activities could provide more opportunities for motorized access and for improvements to the designated system.

Under Alternatives D and E, the prohibition on cross-country game retrieval could cause motorized users to choose to hunt on private property rather than Federal lands. This could result in an increased number of game animals on Federal lands, and create other management problems, such as more competition for forage.

In the future, demand for motorized opportunities is likely to continue to increase as OHV sales and the population increase in the Black Hills. More trail demands would occur as more family units with young children utilize motorized travel as a form of recreation. Despite the fact that increases in fuel prices are not likely to reduce OHV recreation activities, more locals (those users living within a 2 to 3 hour drive) would utilize the Black Hills for their recreation preference. In addition, business opportunities could develop on private properties, within the cumulative effects analysis area, to provide cross-country areas for motorized users seeking opportunities to hill climb or mud-bog.

Engineering and Transportation

Introduction

Beginning in the 1880s, railroads and stagecoach lines were built to accommodate the thousands of people who were coming to the Black Hills in response to the discovery of gold. An extensive rail system was developed to haul mining timbers from the forest to the mines. Large tracts of forest were cut in order to provide timber to the growing mining industry and to provide housing for the people living in the Black Hills. In 1897, the Black Hills Forest Reserve was established, and in 1898, the first timber sale was sold to Homestake Mining Company. By the 1920s, a major highway system was developed and a Forest road system was initiated. Tourism also justified the construction of a transportation system that was adequate for automobiles, which during the 1930s was augmented by the Civilian Conservation Corps (CCC). Subsequent years have seen further augmentation providing a well-spaced, efficient system of roads of all maintenance levels for many different users.

The transportation system currently in place within the Forest is a result of the historic uses described above and the public's expectation that the Forest is available for their use through an extensive road system. The area has since been extensively managed for timber production, livestock grazing, mining activities, big game hunting, wildlife, insect and disease risk, fuels; and for recreational activities along roads and trails that include hiking, horseback riding, mountain bike riding, off-road vehicle use and snowmobile riding.

Use of ATVs and other OHVs boomed nationwide in the late 1980s and early 1990s and has continued to grow. The physical characteristics of these vehicles have changed as well towards larger, more powerful machines. The increased flexibility of these new machines and increased marketing emphasis from industry has resulted in an increased popularity for recreational riding

and access, and for utilitarian purposes such as livestock management. As use of these machines has increased, there has been a corresponding increase in conflicts with other motorized and nonmotorized users, and an increase in resource impacts.

Concerns over the high level of conflicts and resource impacts led to the creation of the Forest Service 2005 Travel Management Rule requiring the Forest Service to address these issues in a standard fashion nationwide. This analysis and subsequent decision will result in a Travel Management Plan for the Black Hills. The Travel Management Plan by direction will concentrate on motorized travel opportunities while considering nonmotorized activities and will close all non-designated, cross-country motorized travel. The engineering and transportation aspects analyzed here are centered on the criteria identified in 36 CFR 212.5

There are currently 9,985 miles of inventoried roads and routes that are within or cross the Forest boundary. These routes fall under multiple systems as listed in Table 1.

Table 20. Miles of inventoried road by system for the Black Hills National Forest

System	Miles of Route	Density (miles/square mile)
National Forest Roads	5,056	2.11
County, State & Federal Roads (Other Public Roads)	820	0.34
Non-System – Unauthorized Roads / Routes	4,109	1.72
Total	9,985	4.18

Note: These figures were taken from the Forest Service Infrastructure GIS database. The analysis area encompasses 2,391 square miles within the Forest Boundary.

Forest Road Density

The average density of all Forest System and other public roads within the Forest boundary was calculated to be 2.45 miles/square mile. For comparison, the density of unauthorized roads was 1.72 miles/square mile.

Forest Service roads within the Black Hills National Forest generally display an even distribution with pockets of higher density around cities and major points of interest. Road densities for the NFS roads network have been calculated at several scales. Results at the levels of the management area, ranger district, Forest, and range allotments and maps showing road density polygons by system type are shown in the Appendix of the 2007 Black Hills Travel Analysis Report.

Regional Connectivity

The Forest is highly connected to the wider region by 12 Forest highways designated under the Public Lands Highways Program of the Transportation Equity Act for the 21st Century (TEA21). These roads are owned by the State, County, or Forest Service, and qualify for Federal funding for improvement or enhancement. Interstate 90 skirts the periphery of the Forest crossing South Dakota from west to east and passes along the east central and northeastern edges of the Black Hills. I-90 serves as a major access corridor to the Forest.

Forest Roads

The roads that are maintained and used for Forest management and other uses are referred to as National Forest System roads (NFSRs). These roads are maintained to various standards

depending on their function, level of use, and management. Of the approximately 9,985 miles of inventoried routes on the Forest, there are 5,056 miles of NFSRs. Roads across the forest fall within multiple jurisdictions as described in the following paragraphs.

The 5,056 miles of NFSRs are under the jurisdiction of the Forest Service and are identified with a NFSR number. The Forest Service has direct maintenance and repair responsibilities for NFSRs. Roads across Forest land but under other jurisdictions such as private or other agency such as county are numbered, maintained and repaired by that specific jurisdiction. Several of the longer, cross-forest roads have sections that are Forest Service jurisdiction and sections that are county jurisdiction. The county sections primarily serve portions of the Forest with high private land density and or high public traffic volumes. Some high-speed arterial roads, such as Deerfield Road and Sheridan Lake Road (both paved), are entirely under the jurisdiction of the counties. County and Forest Service representatives meet periodically to discuss issues related to county and Forest Service-jurisdiction roads that are of joint interest particularly if a major change such as realignment or a surfacing change is planned for a road. Road jurisdictions are periodically transferred as situations change. Roads across Forest land but under State jurisdiction are maintained and repaired by the State and have State road numbers. Similar meetings are held with State representatives on issues of joint interest.

Roads within the NFS network are categorized into three functional classes: arterial, collector, and local roads. Arterial roads are the primary roads of the forest, providing connections between human populations, major recreation sites, highways, and collector routes. Collector roads are those that collect and distribute traffic to multiple access points or local roads. Local roads provide access to smaller and specific sites and form a network within the Forest to provide administrative, commercial, and recreation access. The local roads can also be single-purpose roads (e.g., used for timber, recreation or mineral extraction access) that are designed for intermittent use and are generally closed to vehicular traffic when not in use.

Maintenance Levels

As described on page 7, Forest Service policy establishes five maintenance levels, which define the level of service provided by and maintenance required for a specific road.

ML 2 roads are primarily one lane, native surface roads for high-clearance vehicles. They are usually very low speed with minimal traffic volumes. They are used for activities such as hiking, biking, OHV riding, forest management, and resource extraction. ML 1 roads have been closed to vehicular traffic for periods of over 1 year. Resource protection measures have been performed if necessary, usually resulting in a grassed-over roadbed (i.e. these roads are ‘put in storage’ until the time they are needed again for resource management).

ML 3, 4, and 5 roads are typically crowned, bordered with vegetated ditches, and have cross drains that are generally appropriately spaced for erosion control purposes. ML 5 roads provide the highest standard of maintenance, are generally two lanes, and paved. ML 4 roads provide a moderate level of user comfort, can be single- or double-lane, and have mostly aggregate (gravel) surfacing. ML 3 roads are typically single-lane with aggregate surfacing.

Table 21. Miles of road by maintenance level for Forest Service-jurisdiction roads within the Black Hills National Forest

Maintenance Level	Miles	Percentage of Total
1	1,316	26.0%
2	3,083	61.0%
3	510	10.1%
4	143	2.8%
5	4	0.1%
Total	5,056	

Unauthorized Routes

The 4,109 miles of non–system routes in the Forest are not maintained by the Forest Service. They are referred to in the Travel Management Rule as unauthorized roads and routes because they are not part of the forest transportation system and are not officially recognized by the Forest Service. This statistic represents 41 percent of all inventoried roads and routes and is a number equivalent to 81 percent of all NFS roads in the Forest inventory. The nature of these roads varies, but they are primarily two-track roads that came into being by vehicles leaving NFS roads. The routes were traveled with sufficient frequency to leave an easily noticeable traveled way. Many of these routes are relatively short. Because they are unplanned, they are more likely to be poorly located on the landscape and more likely to have higher erosion potential. The positions of these routes were obtained primarily from interpretation of aerial photographs and input from users. Many of them have not been ground verified. Attempts are made to close problem routes when possible; however, funding and physical location of the routes often limit these efforts. A large number of the non-system routes are also temporary roads that were constructed for vegetation or timber management, and mining and homestead access. They have a road template but they have been closed, revegetated, and not put on the system.

Forest Service Trails

The trails that are maintained and used for forest management and other uses are referred to as National Forest System trails. There are 35 hiking trails that are maintained to various standards depending on their function, level of use, and management. There are 323 miles of inventoried hiking trails on the Forest; 14 miles of these on the Centennial trail are designated for motorized use. Mountain bikes are prohibited from using trails that are located in the Black Elk Wilderness. There are 22 miles of roads on the Bearlodge Ranger District that are currently managed as motorized trails for vehicles less than or equal to 50 inches in width.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Travel Management Rule – 2005

The Travel Management Rule (the Rule -- Federal Register, 70FR68264, see Appendix A) amended regulations at 36 CFR 212, 251 and 261, and removed obsolete direction at 36 CFR 295. This Rule specifically requires the designation of any roads, trails, and areas that are to be open to motor vehicle use on a National Forest. The Rule also directs that designations be made by class of vehicle and by season of use, where appropriate and necessary. Motor vehicle use would be prohibited on routes and areas not designated open to use.

The decision resulting from this EIS will be used to generate a motor vehicle use map that provides the designation information. The modes of travel categories that can be designated are listed below. The designation "Roads Open to All Vehicles" includes smaller off-highway vehicles that may or may not be licensed for highway use, or highway-legal (motorized mixed use).

Modes of travel

- Roads open to all vehicles
- Roads open to all vehicles - seasonally
- Roads open to highway legal vehicle only
- Roads open to highway legal vehicles only – seasonally
- Trails open to all vehicles
- Trails open to all vehicles - seasonally
- Trails open to vehicles less than or equal to 50 inches
- Trails open to vehicles less than or equal to 50 inches - seasonally
- Trails open to motorcycles only – single track
- Special designations (such as rock crawling vehicles)

State Laws Concerning Vehicle and Operator Licensing

South Dakota and Wyoming State Laws describe the legal requirements for motorized vehicles and operators using public highways in the Black Hills. These laws currently require that motorized vehicles operating on public highways be registered and licensed by the State (or be highway-legal), and that operators have a valid state driver's license. Forest Service roads in the Black Hills are considered public highways. Wyoming has an additional statute that allows unlicensed or non-highway-legal vehicles to drive on selected "enrolled" roads if they display a Wyoming OHV sticker. The Travel Management Rule allows the Forest to make designations under 36 CFR 212.55 concerning motor vehicles that are not in accordance with State law under appropriate circumstances. State traffic laws do not apply to National Forest System trails; therefore, non-highway-legal vehicles and unlicensed operators are allowed on designated Forest Service motorized trails.

Applicable South Dakota laws are SDCL 32-20-2 Driver License; SDCL 32-20-12 Operation; and SDCL 32-20-13 Licensing. Wyoming Statute 311-101 resulted in establishment of the OHV program, which includes enrolled roads and a sticker program.

National Highway Safety Act of 1966 – 23 U.S.C. 402

The Forest Service works with the Federal Highways Administration under the authority of the Highway Safety Act of 1966 (P.L. 89-564) to make travel on National Forest System roads as safe as practicable. This Federal law authorizes State and local governments and participating Federal agencies to identify and survey accident locations, design, construct, and maintain roads in accordance with safety standards; to apply sound traffic control principles and standards; and to promote pedestrian safety. Forest Service policy (FSM 7733.03) is to operate and maintain NFS roads that are managed as public roads to provide for safe passage by prudent drivers in standard passenger cars (NFS ML 3, 4 and 5 roads).

Forest Plan Direction

Listed below are some of the current Forest Plan Goals that are applicable to transportation.

Goal 3, Discussion Section:

"The density of the Forest Development Road system where timber will be harvested will generally range between two and five miles per square mile, with the average density around 2.6 miles per square mile."

Goal 4, Objective 416:

"Maintain and construct trails as displayed in the following table:"

Nonmotorized trails (1996)	293 miles
Motorized trails (1996)	14 miles
Nonmotorized trail construction	204 miles
Motorized trail construction, or conversion from road to motorized trail	15 miles (per decade)
Total forest trail system	526 miles (total miles at end of decade)
Reconstruction	100 miles (per decade)

Goal 4, Objective 421:

"Provide the following road system:"

Roads (By the end of the first decade)	
Suitable for public use	4,700 miles
Passenger car -1,200	
High clearance vehicles – 3,500	
Roads closed to vehicles	500 miles
TOTAL	5,200 miles

Guideline 9205:

When maintaining all roads, use the following requirements:

a. All arterial and collector roads – Maintenance Levels 3, 4, 5;

b. Local roads open to low-clearance vehicles – Maintenance Levels 3, 4, 5;

c. Local roads open to high-clearance vehicles – Maintenance Level 2; and,

d. Local roads closed between resource management activities – Maintenance Level 1.

Methodology

The Forest Service identified public concerns with the proposed action during scoping. Those concerns were summarized as general issues. Characteristics of the travel management systems were identified to help define and evaluate the alternatives. The characteristics were summarized as indicators and were used to evaluate the effects of implementing each alternative. The following issues and their indicators apply to the engineering and transportation analysis:

Issue 3 - Effects of transportation system design on management capabilities. The alternatives considered in the DEIS may have effects on the Forest's ability to proactively designate and manage system roads and trails, while also optimizing recreation experiences. The alternatives considered will have different effects on how the transportation system is able to address management concerns (such as law enforcement, user education, signing, and

maintenance) while reducing management costs and focusing limited resources. Addressing many of the management concerns will be dependent on available funding sources, which will most likely be limited. The transportation system design can also affect public safety depending on the miles of motorized-mixed-use roads. Any roads identified for motorized-mixed use will be reviewed in a Mixed-Use Roads Analysis that includes mitigation to make reasonable accommodations for the public's safety. The following are the indicators used to analyze this issue.

Indicators

- Miles of road open to all vehicles
- Miles of road open to highway-legal vehicles only
- Miles of trail open to all vehicles
- Miles of trail open to vehicles 50 inches or less
- Miles of motorcycle trail
- Number of trailheads
- Number of perennial stream crossings
- Miles of open roads to be closed
- Miles of closed roads to be reopened
- Miles of road converted to trails
- Miles of new routes to be converted from unauthorized.
- Number of dead-end spurs
- Miles of motorized-mixed-use roads open yearlong
- Miles of motorized-mixed-use roads open seasonally
- Total miles of motorized-mixed-use roads
- Miles of roads at maintenance levels 3, 4, and 5

Issue 4 - Social and Economic Concerns. The alternatives considered in the DEIS may affect the economic sustainability of local businesses and communities. Effects may be related to sound level (noise), dust (air quality), trespass and access to private property, distance from motorized routes to private land, traffic levels, and miles of routes open to motorized use. The following are the indicators used to analyze this issue:

Indicators

- Miles of motorized routes within 0.5 miles of a nonmotorized trail
- Miles of NFS motorized routes through or within 300 feet of non-NFS lands
- Number of motorized trailheads within 3 miles of a gateway community
- Miles of motorized routes

Assumptions

- Roads & trails that make up the Forest transportation system will be constructed and maintained, to the extent practical, in accordance with Forest Service design standards and South Dakota Best Management Practices (BMPs).

- Current Forest funding resources will be augmented to the extent necessary to develop and maintain a resulting transportation system by fees, grants, partnerships, and cooperative agreements.
- A sound emission limit for ATVs and motorcycles will be established and enforced at 96 DB(A) using the SAE J-1287 measurement standard.
- Law enforcement activity, voluntary compliance, and active public information efforts will result in the recreating public complying for the most part with the modes of travel designations to be established by this decision and as published on the upcoming motor vehicle use map.
- Maintenance level 2 Forest roads that are being actively used for timber hauling will be temporarily closed to OHV use even if they have been officially designated for use on the motor vehicle use map.
- Roads and trails will be adequately signed.

Affected Environment

Safety – Mixed-Use Analysis

Where necessary, a decision on whether to designate roads for motorized mixed traffic will be informed by a motorized-mixed-use analysis performed by a qualified engineer. Depending on the complexity of the situation, the analysis may range from documenting engineering judgment to an engineering report that addresses many factors related to motorized mixed use. The analysis considers the safety risks in terms of crash potential and crash severity of designating highway-legal- and non-highway-legal vehicles for concurrent use on the same roads.

In addition, several roadway factors and traffic uses will be considered in the study. Factors could include such things as prudent driver expectations, traffic type, volume, speed, and road conditions such as surfacing, sight distance, alignment, roadside conditions, etc. The motorized-mixed-use analysis will also identify management options that can be implemented to reduce the risk to a manageable level.

Note that the 2005 Travel Management Rule defines mixed-use on a road as the mixing of highway legal and non-highway legal vehicles on the same road. It does not say mixing of ATVs with cars and trucks. On the mixed-use roads, non-highway-legal OHVs could mix with highway-legal ATVs registered as motorcycles and full-sized vehicles. On highway-legal-only roads, highway-legal ATVs and motorcycles could still be present with full-sized vehicles.

South Dakota State Law Considerations

South Dakota State Law permits properly outfitted OHVs to be licensed as highway legal and, when operated by a licensed driver with proof of insurance, they can be driven on public roads and highways (except the interstate).

National Forest System roads that are open to (not necessarily maintained for) passenger car traffic are considered public highways, which include maintenance level 2 - 5 roads. It is the opinion of the South Dakota Attorney General's Office that unlicensed (non-highway-legal) OHVs are prohibited from National Forest System road maintenance level 2 - 5 roads, where passenger car travel is allowed (letter from the Assistant Attorney General of South Dakota, December 7, 2007). Allowing unlicensed (non-highway-legal) vehicles on National Forest System roads that allow for passenger car travel would not be in accordance with South Dakota State law.

Alternatives B, C, and D contain roads that are proposed to be designated for motorized-mixed use. Such a designation would allow mixing of highway-legal and non-highway-legal vehicles on designated National Forest System roads. This designation that departs from State law is allowed under the Travel Management Rule. However, it creates a difficult situation for law enforcement officers who must determine whether or not vehicles are highway legal and if they are on a designated route. The departure from state law in South Dakota in this case relates only to the portion of the law defining which OHVs are highway legal, determined by how they are outfitted, registered and licensed. All other provisions of the state law defining the legal use of public highways such as valid drivers license, liability insurance, age requirements and helmets for those under 18 will still be in effect on National Forest System Roads.

Wyoming State Law Considerations

Wyoming also allows multipurpose vehicles (MPVs) to be outfitted, licensed, and ridden as highway-legal vehicles on roads. Unlike South Dakota, motorized mixed use of MPVs in Wyoming on public highways is allowed under a special program. The State of Wyoming has implemented an Off-road Recreational Vehicle (ORRV) Program to help manage MPVs in Wyoming. The program describes vehicle requirements, operator licensing, and road types and includes a registration sticker program to help fund the program. Roads and trails that have been designated by land managers for non-highway-legal vehicle travel are referred to as “enrolled”. The ORRV program has no specific safety evaluations necessary to enroll a road. Designating motorized-mixed use on a public highway in Wyoming that is not enrolled would not be in accordance with Wyoming State law. However, it is the intent of the Forest to enroll all roads designated for motorized-mixed use in the Wyoming portion of the Black Hills in the Wyoming State ORRV program if warranted by a mixed-use analysis if warranted.

As in South Dakota, roads in Wyoming designated as “open to highway-legal only” will allow highway legal OHVs to mix with cars and trucks on public highways. Roads designated as “open to all vehicles” (motorized-mixed use) will allow non-highway-legal MPVs to mix with highway legal MPVs and cars and trucks. The difference between highway legal and non-highway legal is how the vehicle is outfitted with lights, horns, mirrors, etc. All other requirements to operate a vehicle, such as driver’s license, liability insurance, helmets under 18, etc., remain in place. A summary of the State law requirements for both states is in Table 22.

Safety – Motorized-mixed-use Indicator Measures

By the State laws in effect, South Dakota and Wyoming have determined that OHVs that are properly outfitted and ridden are safe enough to be on roads with full-sized vehicles. This situation is common to all alternatives. The difference between the alternatives is in the miles of roads of each maintenance level that are proposed for motorized-mixed use. The Forest Service will need to complete the motorized-mixed-use analysis, in some form, to inform the decisionmaker of the safety risks prior to designation of motorized mixed use. In general, roads with motorized-mixed use will likely have a higher safety risk than those without mixing because there may be OHVs present that do not have all of the equipment required for highway-legal vehicles. At this point in the analysis, miles of proposed mixed use can be used to compare alternatives.

Table 22. Summary of State law requirements

	South Dakota	Wyoming
Roads ML 2, 3, 4, 5	Hwy Legal Machine Drivers License (16) Insurance Min Age 14 (Restricted) Ditches – Min 12 years	Hwy Legal Machine Drivers License (17) Insurance Min Age 14 (Restricted)
Enrolled Roads	NA	WY Sticker Drivers License OR WY License Plate Drivers License Proof of Insurance Need Lights at Night Don't need horn or mirror
Mixed Use Roads	Everything required by SD State Law except a Hwy Legal Machine (Includes a Drivers License) Is similar to WY enrolled roads	Intent is to enroll all mixed use Roads in Wyoming
Trails	Non Hwy Legal Machine No Age Limit Black Hills Sticker (Being Explored)	Intent is to enroll all Forest trails in Wyoming
Enrolled Trails	NA	Non-Hwy-Legal Machine allowed No Age Limit WY Sticker

Enforcement

The Black Hills National Forest does not currently have a published Forestwide guidance document addressing motorized-mixed use on National Forest System roads; however, this use is occurring. Current Forest Service law enforcement resources alone are not at a level that would make enforcement of the prohibition of mixed use effective. Local and State law enforcement officer resources are stretched thin also. Successful enforcement of the recent mixed-use opinion from the South Dakota State Attorney General's Office would have immediate impacts on out-of-state riders without license plates and local individuals who do not have a driver's license or who ride machines that are not highway legal in South Dakota.

The enforcement of motorized-travel restrictions is an important part of the successful implementation of the Travel Management Rule. Current law enforcement success has been limited by scarce resources, an uninformed public, and a complex matrix of closure orders. Limited enforcement success has likely contributed to increased road and area use violations, user conflicts, and resource damage.

In some respects, enforcement of the new travel management rules will likely be more efficient and effective after implementation. A motor vehicle use map will be available. Route identification signs corresponding to which roads are designated for travel should be on the ground. Off-route motorized travel in non-designated areas will be prohibited. There are a large percentage of motorized users, including individuals, motorized and nonmotorized groups, landowners and businesses that are knowledgeable and concerned that the Forest is protected and that access to the Forest be preserved. The conscious efforts of this large group may aid

significantly in informing the relatively small group that is either uninformed or unwilling to recreate in a manner that is legal and responsible.

Signs

Clearly marked roads and trails aid all users in knowing what to expect on the route ahead. Trails can be signed for user restrictions, difficulty levels, distance, connections, etc. A properly signed trail is important to the success of the trail system. Installation and maintenance costs for trail signing must be considered when designing the sign plan for a trail system. Signs will be an important mitigation tool if roads are designated as open to all vehicles to inform the public of the potential presence of non-highway legal OHVs.

It is possible that vandalism of Forest signs will decrease after implementation of the Rule if Forest users recognize that destroying a sign that locates a route that is open to motorized travel will reduce the usability of the system overall. A road and trail system map will be available but the loss of signs will make it more difficult for users to determine where travel is legal. New or increased funding sources will likely be necessary to provide signs for a new trail system. Future signing efforts will likely reflect a selective process based on monitoring and evaluation of need.

The 2005 Travel Management Rule reduces reliance on signing on the ground somewhat with the requirement of the production and use of a motor vehicle use map. The motor vehicle use map describes the vehicle types and time periods that are legal on designated roads and trails and places the burden on the user to know their location. With the availability of the motor vehicle use map to the Forest user, their presence on a route or in an area that is prohibited will be all that is required for a citation to be upheld; however, a current and effective system of signs should be very helpful in reducing citations.

Sound Levels

An increasingly important issue in the Black Hills and across the nation is the sound level associated with off-highway vehicles especially in otherwise quiet areas. Feedback resulting from requests for comments here in the Black Hills has indicated serious concerns from nonmotorized users and adjacent landowners about sound levels as OHV motorized recreation escalates. The effect of high sound levels on wildlife is also of concern. The Forest Service does not currently have a stationary sound limit for the Black Hills.

There is an industry standard applied to many OHVs for the sound level produced by the machines when manufactured. However, because of aftermarket changes and deterioration of mufflers with use, many of those machines exceed the original equipment manufacturer (OEM) levels. The sound level of some machines has produced a negative attitude toward some OHV recreation and has likely contributed to the loss of OHV riding areas across the country.

Land management agencies, including the Forest Service, and some states across the country have started establishing legal limits for sound emissions from OHVs including motorcycles. It has been proposed that this decision will establish a 96 DB(A) sound emission limit for OHVs on Black Hill National Forest roads and trails. This limit is common to all alternatives. Limiting the allowable sound level for OHVs to a level of 96 DB(A) would very likely help mitigate some of the user conflicts on the forest. The 96 DB(A) noise level was selected because it is the maximum level currently mandated by at least five states and is regarded as an adequate limit by the EPA and motorcycle manufacturers (American Motorcyclist Association 2005). This noise

level would be measured based on the Society of Automotive Engineers (SAE) stationary test standard J1287.

Using the OEM standard sound level would also help reduce the costs to the motorized users if they purchase a machine that complies with the standard, maintain the mufflers and spark arrestors, and avoid replacing the original equipment with equipment at a higher sound level. Recreationists who currently use machines that exceed the limit would have to make the necessary modifications. Equipment that meets the sound limits is available for most machines in use today.

Sound limits and sound measurements are being used successfully in other forests and natural resource areas. Enforcement of the sound level limit is key to the success of those programs. A simple sound measuring instrument is available at a reasonable cost. Testing using the SAE Standard J-1287 is relatively fast and straightforward; however, proper equipment and training is necessary. Testing could be performed by dealers, cooperators, volunteers, and Forest Service law enforcement officers. Testing could be conducted at dealerships, trailheads, and spot checkpoints to assist OHV users in determining if they are within the limit. An appropriate fine for exceeding the sound limits such as $100 for the first offense, $500 for the second offense, and confiscation of the machine for the third offense might also be necessary for success.

Indicator measures that allow determining the differences between alternatives relating to sound level conflicts have been developed. The first indicator measure is the distance that a designated route is away from private land. Many private landowners value quiet, natural landscapes and privacy, and close proximity would present a risk of conflict with those values. A secondary risk would be presented by the opportunity close proximity would present for unauthorized incursion onto private land. A distance of 300 feet from private land was selected as an indicator because it is the approximate distance at which the sound emitted from a motorized vehicle at a sound level of 96 DB(A) would attenuate to approximately 50 DB(A) which is the sound level of an average office. This ending sound level assumes normal attenuation based on distance only; however, it is probable that there would be additional attenuation in most situations based on interference from topography and vegetation. The expected resulting sound level would not equate to a forest setting on a quite night; however, it would not be expected to be much higher than ambient noise during the day with normal human activity and the wind blowing.

The second indicator measure is the distance that a designated route is away from nonmotorized trails. Many nonmotorized users of the forest value quiet, wildlife viewing, and natural landscapes, and close proximity with motorized users and high sound levels would present a risk of conflict with those values. Again, a secondary risk would be presented by the opportunity close proximity would present for unauthorized incursion onto nonmotorized trails. A distance of 0.5 mile from nonmotorized trails was selected as an indicator because it is the approximate distance at which the sound emitted from a motorized vehicle at a sound level of 96 DB(A) would attenuate to approximately 30 DB(A) which is the sound level of a whisper. This ending sound level assumes normal attenuation based on distance only; however, again it is probable that there would be additional attenuation in most situations base on interference from topography and vegetation. The expected resulting sound level would not equate to a forest setting on a quite night; however, it would not be expected to be much higher than ambient noise during the day with normal human activity and the wind blowing.

Dust

Air quality impacts from National Forest System roads are associated with vehicle emissions and dust from traffic on unpaved roads. These effects typically are localized and temporary, and their extent depends on the soil types, moisture levels and the amount of traffic. Most of the unpaved ML 3 and 4 roads under Forest jurisdiction are located in unpopulated areas with relatively low traffic volumes. Dust issues on ML 2 roads typically are less severe. Dust abatement is a relatively expensive activity and is dependent on budget levels and priorities. Historical budgets have not been sufficient to support other than minimal abatement activities on roads with high logging truck activity.

Concentrating motorized use on roads and trails and developing trailheads can potentially increase the amount of dust created in some areas. Converting roads to trails or otherwise creating new motorized trails will create an opportunity to route trails through materials that are less likely to give off dust; to bring in stable, low-dust, surfacing materials; and to try new surface stabilization chemicals. A new or increased source of trail-related funding would likely have to be found to do this.

An indicator measure that would help determining the differences between alternatives related to conflicts related to dust is the miles of routes within 300 feet of non-forest land.

Costs

Economic Feasibility

The monetary costs associated with the road system in the Black Hills are substantial to the Forest Service, the counties and the State & Federal highway organizations. The estimated costs to the Forest Service to manage NFS roads to standard, for the long term, are calculated using the Forest Service Infrastructure (INFRA) database. The INFRA database summarizes annual and deferred maintenance costs and overhead. Annual maintenance costs include such things as routine road surface blading and culvert cleaning, and the annualized cost of replacing signs and road surfaces, mostly gravel. Deferred maintenance costs reflect maintenance that was not performed when it was scheduled and was delayed for a future period. These costs could include aggregate replacement, and culvert and sign replacement. The estimated costs for ML 1, 2, 3, 4, and 5 roads for annual and deferred maintenance are shown below.

Table 23. Annual and deferred maintenance costs for Forest Service System roads on the Black Hills (2007 figures)

Maintenance Level	Miles	Annual Maintenance Cost	Deferred Maintenance Cost
1	1,310	*	**
2	3,117	***218,260+	**
3	510	6,408,940	11,712,273
4	143	1,539,646	4,210,111
5	4	73,544	750,097
Total	**5,084**	**$8,240,390+**	**$16,672,481+**

*These roads are closed to motorized traffic. They are left to revegetate and are typically not maintained unless monitoring efforts have identified a need to prevent or mitigate erosion damage.
** There is not sufficient data in INFRA to formulate an accurate estimate for deferred maintenance on these roads.
*** The INFRA data is not complete for these roads. This estimate was based on local estimated blading costs per mile and maintaining each road once every five years. It does not include the maintenance costs of gates, signs and culverts, which if known would add to the total.

The historical resources expended to perform the reconstruction, maintenance, and repair of all Forest Service roads and trails are shown in the following table.

Table 24. Road and trail management funding sources

Funding Source	Type	FY 2003	FY 2004	FY-2005	FY 2006	FY 2007	FY 2008
FS – Congressional Appropriations	Road Construction / Maintenance Fund	$3,244,000	$2,934,600	$2,324,784	$2,132,596	$3,085,900	$2,818,400
	Trail Construction / Maintenance Fund	$270,900	$236,700	$209,700	$148,000	$174,000	$161,400
Road & Trail Deposits (Timber Receipts)	10 % Fund (LG)	$400,000	$77,100	$45,000	$243,733	$211,800	$304,400
	Forest Service Total	**$4,033,400**	**$3,248,400**	**$2,579,484**	**$2,524,329**	**$3,645,000**	**$3,284,200**
Timber Sale (TS) Purchasers Direct	TS Road Reconstruction	$496,265	$839,280	$182,560	$413,308	$258,968	$265,829
	TS Road Maintenance	$67,200	$55,055	$72,124	$115,884	$95,528	$158,129
	Maintenance Deposits	$4,928	$6,111	$8,068	$0	0	$1,228
	Surface Rock Replacement	$120,169	$75,491	$89,464	$42,175	$37,621	$179,240
	Reconstruction Deposits	$201,358	$100,834	$141,372	$95,682	$56,654	$74,285
	Timber Purchasers Total	**$889,920**	**$1,076,771**	**$493,588**	**$667,049**	**$448,717**	**$678,711**
Total Funding		**$4,923,320**	**$4,325,171**	**$3,073,072**	**$3,191,378**	**$4,093,717**	**$3,962,911**

The congressional appropriation budget for planning, construction, capital improvement, and maintenance of forest roads and trails on the Black Hills National Forest has been fluctuating noticeably in the six years detailed above. The road funding decreased from $3.2 million in 2003 to $2.1 million in 2006, a 34 percent decrease. Much of that decrease rebounded in 2007 and 2008; however, the long-term trend is down, especially if inflation is considered. Trail funding followed a similar trend but did not recover substantially. Future allocations are based on political priorities that are based only partially on the need and are difficult to predict.

Road and trail deposits (10% Fund) are 10% of Black Hills National Forest timber receipts that are returned to the Forest Service. The amount of this fund that is available for road and trail maintenance varies directly with the amount of timber sold and with internal Forest allocation priorities. Large variations in the amount of timber sold will have an impact on this source of funds.

Capital improvement funds acquired to conduct trail and road improvement work necessary to bring the system up to the desired objective have been sporadic and minimal in past years. However, the Forest has benefited from a regional bridge program that has funded 11 bridge replacements in the last 7 years.

A portion of the road maintenance on Forest roads is performed by timber purchasers and fuels treatment contractors on roads where timber products are being transported. The cost of road maintenance work performed by the purchasers is shown in Table 24. The level of expenditure is linked to the volume of timber, number of sales, and the miles of road needed to remove the timber from the Forest. Road maintenance needed due to impacts from timber sales is funded by the purchasers in two ways. The first is road-maintenance work performed by the purchasers directly. The second is payments for maintenance and surface rock replacement that are made to the Forest Service, who then contracts or performs the work. In addition, timber sale receipts are used for road reconstruction deposits that fund engineering services necessary to design the reconstruction elements of the timber sale road specifications. These road reconstruction funds are collected based on the actual cost to the Forest Service for these services.

The Forest encompasses 418 miles of county roads. These roads are integral to the Forest transportation system. In some cases, the Forest Service and the counties have jurisdiction over different sections of the same road. The counties receive payments from the Forest Service that can be used to support these roads under two programs, Payment in Lieu of Taxes (PILT) and the 25 Percent Funds. The PILT funds are based on the acres of Forest land in the county and are intended to help compensate for the loss of taxable base. The expenditure of PILT funds is at the discretion of the counties. In 2007, the counties with boundaries within the Forest received PILT funds of $1,529,146. The 25 Percent Funds are those portions of receipts the Forest Service receives each year primarily from the sale of timber. The 25 Percent Fund Act provided for 25 percent of actual receipts to be paid to the counties. The Secure Rural Schools and Community Self-Determination Act of 2000 provided the option for counties to receive the average of the three highest 25 Percent Fund payments made annually from 1986 to 1999. All counties within the Black Hills elected to receive payments by this leveled method. Therefore, the impact of fluctuating timber receipts is minimized. The use of these funds is limited to roads and schools.

In 2007, the counties received $4,323,739, which is a figure that has been adjusted for inflation since 2001. In recent years, Congress has been increasingly hesitant to re-authorize the Secure Rural Schools and Community Self-Determination Act. As of September 23, 2008, the Act has not been passed to allow level payments in fiscal year 2009. If it is not passed, payments to the counties under the 25 Percent Fund Act will fall to a level that represents 25 percent of current timber receipts, which are significantly lower now than those used to establish the high-three level of payments.

The overall level of Federal funding and timber purchaser expenditures is not sufficient to perform the short- and long-term maintenance needs identified for NFS roads in general. The annual road maintenance resources are approximately 50 percent of what is needed based on the INFRA database. The Federal portion of that funding is trending downward. If the INFRA Database funding needs estimates are reasonably accurate, without new resources, the long-term condition of NFS roads is expected to deteriorate. The increased use of roads, particularly the ML 2 roads, subsequent to the implementation of the Rule could put increased pressure on limited maintenance resources.

Trails

The current trail system on the Forest is made up of 35 hiking trails for a total of 323 miles. Twelve miles of the Centennial Trail are also designated as motorized yearlong. There are 24 miles of seasonal motorized trails in the Bearlodge Ranger District in Wyoming. Those trails are on road templates that have been restricted to trails 50 inches or less in width. The section of the Centennial Trail that is motorized is heavily traveled resulting in significant maintenance costs

every one or two years. A one-mile reconstruction contract in 2006 cost $17,000. The condition of the trails varies widely depending on the type of trail (Forest, national, wilderness, motorized, etc.), the volume of use, the terrain, and the type of soil. Current maintenance funds are not sufficient to maintain the current trail system to standard. An increase in the number of miles of motorized trail would not be environmentally sustainable in the long term without an appropriate increase in the trail construction and maintenance resources.

Cost of Maintaining Roads with Increased or Concentrated OHV Traffic

Alternatives B and C involve designating the majority of the open ML 2 roads to allow ATV use with either a highway-legal or a non-highway-legal machine. In many situations, ATVs tend to follow the same path even when traveling on a 12-foot ML 2 surface. This practice, along with the aggressive tire tread design and the native soil surfaces on these roads, leads to two-track rutting similar to what is shown in the picture below (Figure 5). The rate at which the rutting occurs is related to the amount of traffic, the erosion characteristics of the soil, the grade of the road, and the number of curves in the road.

Figure 5. A maintenance level 2 road with damage caused by ATV track following. The damage is increased by erosion when the tracks channel water down the road.

The current maintenance goals for ML 2 roads are to check them once every 5 years and address maintenance issues if necessary. Some roads have grown grass and have little traffic; this allows them to go many years without any ground-disturbing maintenance such as blading, reconstructing rolling dips, and cleaning culverts. Others require maintenance every 5 years or sooner because of deterioration from high use, poor soils, high rain events, use when wet, or steep topography. The exact impact to ML 2 roads from closing the Forest to off-road use and forcing more of the existing ATV traffic onto roads, especially ML 2 roads, is hard to predict. It is predictable that the ATV traffic on ML 2 roads will increase and the increase will vary based on the location of the road and how the road connects with access points and the rest of the system. The increased traffic should increase the frequency of maintenance needed for these

roads in general. Estimates from other Region 2 forests that maintain ML 2 roads under these conditions average $350 per mile.

The level of maintenance will also likely be affected. ATV ruts, even though they are only a percentage of the road width, will result in the entire roadbed being bladed to repair them. Roads that may have remained stable and/or grown grass under larger vehicle traffic will now more frequently have the native surface exposed to the elements of erosion after blading. The ATV track damage and increased erosion also have a more significant effect on rolling dips causing them to fail more quickly. This failure is usually in the form of a track cut in the cross-road berm that allows water to pass down the road and/or the dip filling with sediment more quickly allowing water to pass down the road.

Alternatives B, C, and D also involve designating some roads that are currently closed (ML 1) for use as motorized trails, and designating some unauthorized routes, that are actually old constructed roadbeds, as trails. If these routes are not redesigned and reconstructed as motorized trails, the problems and costs associated with maintaining them will likely be similar, if not more difficult and costly, than those of maintaining ML 2s. Many of them may have missing drainage structures that were removed when they were closed. These routes will have many of the same physical characteristics of an ML 2 but they are likely to be more heavily traveled. It is also possible that one of the reasons that they were no longer being used is that they were located in difficult terrain that made erosion likely.

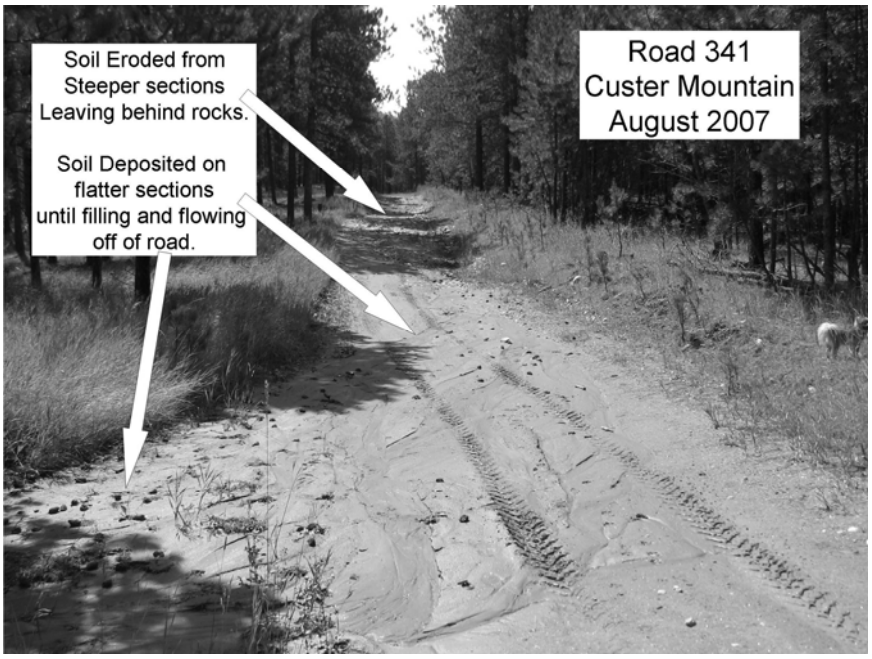

Figure 6. A maintenance level 2 road with erosion damage accelerated by ATV traffic loosening soils on steep section

The Forest also has 653 miles of gravel roads (ML 3s and ML 4s). The surfaces are hardened and are less susceptible to damage from ATV traffic. These roads are currently open to highway legal ATVs with little, if any, maintenance problems reported that are due specifically to ATVs. It is possible that higher usage rates or concentrated usage around trailheads and popular visitation sights will present maintenance issues; however, they would be difficult to estimate at this time.

Cost of Building and Maintaining Motorized Trails

Alternatives B, C, and D involve designating from 181 to 460 miles of routes as trails 50 inches or less in width (year round and seasonal). These trails are currently closed roads (ML 1), unauthorized routes that were old roads, unengineered routes that were pioneered by cross-county travel, and trails that are proposed but have no physical form currently on the ground.

Generally, for a motorized trail to be environmentally sustainable, it should be engineered and constructed as a motorized trail. ATVs can be hard on trail surfaces. Experience maintaining the 12 miles of motorized Centennial trail has shown that ATV traffic can quickly put this trail in a state of disrepair, even though it has been engineered and reconstructed as a motorized trail. We do not yet have a vehicle-per-day use rate but we know that it is high, especially in the summer. Current maintenance activities are not frequent enough to keep the trail in good condition. A lot of the damage occurs when the trail surface is wet and soft as there is not currently a procedure to close the trail when it is wet.

Designating motorized trails that have not been specifically designed and constructed for ATV use runs the risk of creating a system that will be difficult to maintain. Trails that are on old roadbeds could have the problems described above. New trails that have not been located on the ground with the features like proper grades, drainage structures, curve radius, and soils can quickly deteriorate and accelerate erosion and sediment transport. The rate of deterioration will depend a great deal on the amount of traffic and the firmness of the soil. A trail across rocky ground will hold up quite well even under heavy traffic. Likewise, a trail with light traffic on erosive soils may be unsustainable even in the short term. A long-term average figure for motorized trail maintenance is not available from experience on the Black Hills because of the small number of miles of motorized trail however estimates obtained from other Region 2 Forests that do have large systems average $350 per mile.

Figure 7. A motorized section of the Centennial Trail less than one year after it underwent an expensive reconstruction

Figure 8. Bridge crossing on motorized section of Centennial Trail

The cost of motorized trail construction will vary based on the equipment used, the type of soil, the topography, the number of drainage structures needed and the number of stream crossings. Estimates to construct a new trail under a contract, both here and in other Region 2 forests have ranged up to $20,000 per mile. Constructing a motorized trail on or near a previous road template may result in lower costs than constructing across unbroken ground; however, the amount of work required will still be significant. The routes that have been selected for designation as trails 50 inches or less in width in the action alternatives have been reviewed in general by District personnel. They have not yet undergone a detailed engineering analysis to try to predict how they would hold up under ATV traffic. It is possible that many of them can be put into use as they currently exist; however, they should be monitored closely and mitigated or closed should problems arise. Further engineering observations on some routes may suggest that they not be implemented until serious issues can be mitigated.

Cost of Building and Maintaining Motorcycle (Single-Track) Trails

Alternatives B, C, and D outline between 21 and 134 miles of single-track motorcycle trails. No trails currently in the Black Hills National Forest are designed and maintained by the Forest Service specifically for motorcycle use. The trails being considered are user-created and were requested by current users. They have not been designed and constructed for such use. Because of their smaller footprint, their potential for erosion and sedimentation damage are less than trails 50 inches or less in width, and roads, if located properly on the landscape. As with trails 50 inches or less in width, the cost of constructing single-track motorized trails will depend primarily on the type of equipment used, topography, and soils, but on average, the costs should be less than for trails 50 inches or less in width.

Costs of Building and Maintaining Trailheads

Alternatives B, C, and D call for between 23 and 34 trailheads for motorized users. There are currently seven trailheads in use. The cost of the trailheads will depend on the topography, size, and anticipated use rate. Smaller trailheads may be able to start with minimal construction and then be reconstructed as use rates increase.

Cost of Mitigating Perennial Stream Crossings

Alternatives B, C, and D describe motorized trail systems that involve numerous perennial stream crossings. Mitigations for these crossings include concrete mats, culverts, and trail bridges. The costs will be associated with the size of the crossing, soils, topography, and type of crossing. Estimates for "average" crossings include:

- Trail Bridge - $10,000 to $15,000
- Concrete mats (4 x 16 feet) - $700
- Culvert (30 inches) - $600

Environmental Effects Analysis

A roads analysis was conducted on Black Hills National Forest high-speed roads resulting in a Roads Analysis Report (RAP) published in October 2005. A travel analysis was conducted on high-clearance roads, trails, and unauthorized routes resulting in a Travel Analysis Process (TAP) Report published in September 2007. These reports provide a technical, science-based review of the Black Hills National Forest transportation system. The objective of these reports was to provide information to assist managers in making decisions concerning the environmental sustainability, socially acceptability, and economic feasibility of the Forest transportation system. The information in these reports was used in varying degrees in developing the environmental analysis here and throughout the specialist's reports for this DEIS.

Alternative A - No Action

Direct Effects

If implemented, this alternative would result in little change from the current situation. Users would likely continue to create unauthorized routes. Mixed use and use of roads by unlicensed operators would likely continue on all Forest roads unless the recent interpretation from the States Attorneys Office is released to the public in an effective public information campaign and the restriction of non-highway-legal vehicles on all Forest roads are enforced.

User conflicts over excessive sound levels would likely continue at the current level or increase. This would likely be most serious near private property in or near the Forest. Certain users would likely continue to modify stock exhaust systems to increase sound emissions.

Citizen complaints concerning dust levels created primarily from ATVs would likely continue at the present rate or increase with the projected increase in ATVs.

Funding for maintenance and repair of roads and trails would likely continue to vary subject to changing Federal budgetary priorities. The material condition of the road and trail system would likely deteriorate over the long term. The costs to repair damage caused by unauthorized routes would likely increase.

Indirect Effects

In the absence of any outside changes at the state and county level that would effect the operation of non-highway legal vehicles, the overall risk to the safety of non-highway-legal operators on the Forest could increase. Projects to close and repair resource damage related to unauthorized routes would likely compete with other worthwhile projects for funding.

User conflicts between motorized and nonmotorized advocates and the resultant animosity that is sometimes demonstrated will likely increase. The backlash from nonmotorized users is likely to continue or increase.

Action Alternatives

Direct and Indirect Effects

Roads Open to All Vehicles (Motorized-Mixed Use)

Direct Effects - If implemented, Alternative E would likely present the safest overall system of the action alternatives based solely on the number of miles open to all vehicles. It is similar to the no action alternative in the amount of mixed-use designated; however, its restricting of OHV traffic to roads and trails should result in less accidents because the travel would be on roads with less steep grades than the off-road topography that would be allowed under A. This assumes that public information and enforcement activities are successful in restricting the majority of the OHV traffic to the Forest roads. Alternative D would be the next safest alternative based on the number of miles and that the mixed use should occur in more limited areas. Alternatives B and C, with the high number of miles of mixed-use roads would be the least safe of the alternatives with B being slightly safer.

Table 25. Miles of roads open to all vehicles (motorized-mixed use) by alternative

Indicator Measure in Miles	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Roads Open to all Vehicles - Yearlong	148	1,638	1,956	315	148
Roads Open to all Vehicles - Seasonally	12	588	922	265	12
Total Roads Open to all Vehicles	160	2,226	2,878	580	160

The small number of miles for Alternatives A and E reflect the roads enrolled in the Wyoming Off-Road Recreational Vehicle (ORRV) Program. They are the only roads where motorized-mixed use is currently legal under State law.

Indirect Effects - The implementation of any of the action alternatives could reduce the risk of accidents involving non-highway-legal vehicles and operators by effectively reducing that traffic on Forest. This assumes that enforcement of applicable State laws and the resultant Travel Management Decision are advertised and enforced at an adequate level.

Sound Levels

Direct Effects - All of the action alternatives contain the proposal to establish a sound level restriction of 96 DB(A) as measured by SAE Standard J-1287. This restriction alone, if effective, should reduce the number of user conflicts and complaints that are based on sound. It would establish a framework for testing vehicles for sound emission and allow law enforcement to issue citations.

Concerning the indicator designed to approximate the effect of sound levels on conflicts and complaints from private landowners in the Forest (miles within 300 feet), implementation of Alternative D should provide the best results. Alternatives B, C, and E are relatively equal in the number of miles of routes that are near private land.

Table 26. Miles of routes near lands of other ownership and nonmotorized trails by alternative

Sound Level Indicator Measure	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Miles of routes within 300 feet of lands of other ownership	504	490	500	423	504
Miles of routes within 0.5 mile of a nonmotorized trail	318	358	382	211	318

The indicator designed to compare the relative quiet experienced by users on nonmotorized trails is the number of miles of motorized routes within 0.5 miles of nonmotorized trails. If implemented, Alternative D should be significantly more effective in this area. Alternative C, B, and E would be less effective in that order.

Indirect Effects - The establishment of maximum sound emission levels could sensitize the general public to the importance of the issue and could have impacts outside the Forest as well. It is possible that moving existing cross-county traffic onto designated roads and trails will increase the average sound levels in some areas.

Dust

Direct Effects - This indicator was designed to allow comparison of the possible dust levels experienced by owners of private land in or near the forest. If implemented, Alternative D again should be more effective in this area based on it having the lowest number of miles in this category. Alternatives B, C, and E would be less effective and are relatively equal in the number of miles of routes that are near private land.

Table 27. Miles of routes near lands of other ownership and nonmotorized trails by alternative

Dust Indicator Measure	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Miles of routes within 300 feet of lands of other ownership	504	490	500	423	504

Indirect Effects - It is possible that moving existing cross-country traffic onto designated roads would increase the dust levels in some areas.

Cost

Direct Effects - The number and uncertainty of the variables involved in estimating projected costs for implementing the action alternatives makes that task very difficult and the answers perhaps unrealistic at this time. The exact, long-term effect of increased use of OHVs (mostly ATVs) on ML 2 roads on this forest is unknown although it is expected to increase the need for maintenance activities. The cost to create and maintain new trails 50 inches or less in width, and motorcycle single-track trails will vary significantly based on the soils and the topography. The cost of perennial stream crossings would depend on the size of the streams and the type of crossings. The final size, location, and complexity of trailheads would have a significant impact on the cost. The detailed engineering design work has not yet been completed on which to base reasonable cost estimates for the above indicators for each alternative.

Table 28. Miles of various roads and trails by alternative

Cost Indicator Measures	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Miles of Road Open to All Vehicles	160	2,226	2,877	580	160
Miles of Road Open to Highway Legal Vehicles Only	3580	1,240	704	2297	3580
Miles of Trail Open to All Vehicles	0	147	154	112	0
Miles of Trail Open to Vehicles 50 Inches or Less	36	414	460	181	36
Miles of Motorcycle (Single Track) Trail	0	76	134	21	0
Number of Trailheads	7	31	34	23	7
Number of Perennial Stream Crossings	1,778	547	536	455	547
Miles of Open Roads to be Closed	0	267	282	830	0
Miles of Closed Roads to be Reopened	0	224	331	90	0
Miles of Roads to be converted to Trails	0	207	205	146	0
Miles of New Routes to be Converted from Unauthorized	0	396	527	168	0

To fully implement alternative B, C or D would be quite costly and beyond the reach of any funding currently available. If implemented, Alternative E would not create a motorized trail system outside of using existing roads and would be the most supportable with current funding. Maintenance cost for ML 2 roads would increase at a rate relative to the increased use of those roads as the years progress. Activities are ongoing towards identifying additional resources of different kinds to implement and maintain a system outlined in the upcoming final decision. The success of those efforts will determine in large part the rate at which such a system could be implemented and its long-term size.

The indicators in Table 28 are useful in providing a relative cost comparison of Alternatives B, C, and D. Miles of trails, number of trailheads, miles of roads to be closed, and number of perennial stream crossings would have the largest effect on long-term costs. These indicators show that Alternative D would have significantly lower costs than Alternatives B and C. Alternative C would be the most costly, with Alternative B a close second.

Indirect Effects - The successful implementation and financing of an appropriately sized OHV recreational system in the Black Hills could increase local involvement in the direct support of the system in the form of individual and user group volunteer efforts, partnerships, and co-op programs. It could increase the level of voluntary compliance with the rules, thus augmenting law enforcement efforts. A viable system could also have significant long-term economic benefit to local businesses and communities from steady or increased motorized recreation users from local areas and out of state. Successful implementation could also serve as an example that could be emulated statewide. The need for funding of a successful system may also have an influence on State legislation in the long term.

Cumulative Effects

Past, Present, and Foreseeable Actions

The cumulative effects area for engineering and transportation includes the area within and immediately adjacent to the Black Hills National Forest boundary. A time scale of 5 to 15 years is based on the time over which one can expect to predict reasonably foreseeable actions.

As local communities continue to grow and as tourism continues to increase, more people may come to the Forest to visit and recreate. The easier it is for people to visit and recreate on the Forest, the greater the demand on the transportation system. The increased demand would likely lead to increased maintenance needs.

Over time, and as funding permits, the travel management plan will be implemented on the ground. Recreationists would benefit from precise maps and signs guiding their travels. Damage and repair costs associated with the motorized use of undesigned, unauthorized roads and trails should decrease as these routes grow grass or are rehabilitated.

The enforcement of State laws concerning the use of highway-legal vehicles and licensed operators on NFS roads should improve the safety environment involving OHV recreation. The enforcement of the new sound limit on OHVs could reduce their effect on wildlife and result in less animosity from nonmotorized users of the Forest.

The transportation system will continue to evolve in an effort to meet future access needs for commodities and recreational opportunities across the Forest. The size of the transportation system would also change to respond to any negative environmental effects of certain routes discovered during monitoring efforts and any fluctuations to available resources. The designation of roads and trails for OHV use would evolve guided by environmental analysis conducted for vegetation management projects.

Implementation and enforcement of policies outlined in the Travel Management Decision could have an effect on the policies of surrounding city, county, and State governments.

Implementation and Monitoring

The transportation system that will be designated by this decision has the potential to be very large and quite complex. It is also likely that there will be numerous changes to the existing system. Implementation of a fully developed motorized trail system will, by necessity, have to be a staged process. Roads and trails whose existing condition are adequate to hold up under the designated traffic could be shown on the first edition of the motor vehicle use map and be available for use immediately. Trails that need to be constructed or reconstructed from roads should not be opened until resources are available and construction or reconstruction and signing are complete. The timetable for implementing this part of the system will depend directly on the rate at which resources become available.

The road and trail system will have to be monitored on a continuing basis to evaluate how each section is holding up to the designated use. Maintenance schedules will be set based on wear related to use, location, soils, etc. Some routes that are not sustainable will have to be rerouted or closed. Any conditions that result in significant user conflicts will also have to be monitored and modified as necessary.

Socio-Economic Concerns

Introduction

Socio-economic concerns are an important consideration for Forest Service management of public lands. The study area for the socio-economic discussion focuses on public lands managed by the Black Hills National Forest, which includes portions of northeastern Wyoming and southwestern South Dakota. The social and economic discussion attempts to identify potential effects that Forest Service travel management decisions may have on people using and valuing

the natural resources that the Black Hills National Forest provides and on local, county, and regional economic systems.

User conflicts are primarily related to social values among motorized and nonmotorized users of the Forest. Some of the conflict is “related to the rate of speed at which their preferred recreational activities take place and the noise generated by recreational machines (Thompson et al. 2007).” Travel management decisions are most likely to affect tourism-related sectors. Direct economic impacts on the Black Hills region derive from users who purchase services and goods associated with their motorized activities on the Forest.

The effects of the proposed project on social and economic resources were incorporated into the development of key issues. This section addresses the potential social and economic effects of the alternatives.

Background

Preliminary public involvement was initiated in 2003 in an effort to familiarize the public and stakeholders throughout the Black Hills region with the objectives of travel management. Between 2003 and 2007, the Black Hills National Forest hosted and participated in numerous public meetings and workshops in Wyoming and South Dakota.

Between 2004 and 2006, the Off Highway Vehicle and Travel Management subcommittees of the Black Hills National Forest Advisory Board conducted a number of public meetings to solicit general comments on travel management. The meetings were held in South Dakota and Wyoming to discuss and review Subcommittee objectives and the current Forest Service national OHV policy direction, and to outline plans for the future. The purpose of these meetings was to gather input to help develop recommendations for future OHV policy planning.

The Travel Management Subcommittee also distributed a User Needs Assessment Questionnaire to solicit comments from both OHV and non-OHV users to evaluate the potential for establishing a designated OHV trail system on the Black Hills National Forest. The 559 comments submitted helped the Subcommittee define opportunities for an OHV trail system and understand potential conflicts with other users.

The National Off-Highway Vehicle Conservation Council (NOHVCC) in cooperation with the Black Hills National Forest conducted an OHV Route Designation Workshop in October 2006 for agency personnel and the public. The purpose of this workshop was to assist the Forest Service and the public in effective implementation of the Travel Management Rule.

Four “Travelways” Workshops were conducted by the Forest during November, 2006. The purpose of these workshops was to gather public input and ideas for the development of a proposed action. A product from these workshops was a collection of forest site-specific information from participants after they completed a mapping exercise.

The public was also asked to provide input to the Forest on routes they wanted to remain open and/or those routes that may be in conflict with other desired conditions sought by the public on National Forest System lands. This initial public involvement resulted in the agency receiving numerous comments on individual routes, a large number of general comments, and some area-wide comments. This preliminary public input helped the Forest to develop a proposed action. In response to the proposed action and public meeting, 756 comments were received.

Based on the public scoping comments, along with resource-related input from the interdisciplinary team, a set of key issues were developed to carry forward into the environmental analysis process. The effects of the proposed project on social and economic resources were also incorporated into key issues during the DEIS development process. That issue is discussed below.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

There are a number of laws, regulations, and policies that provide regulatory and agency guidance for the preparation of social and economic analyses, such as:

- National Forest Management Act of 1976 (NFMA) – 16 U.S.C. 1600
- National Environmental Policy Act of 1969 (NEPA) – 42 U.S.C. 4321
- Executive Order 12898 (February 11, 1994), Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations.

There are also Forest Service Handbooks and Manuals that include social and economic analysis requirements based on other resource direction.

Forest Plan Direction

Forest Plan Goal 8. Promote Rural Development Opportunities. “Rural development” is the management of human, natural, technical, and financial resources needed to improve living conditions, provide employment opportunities, enrich the cultural life, and enhance the environment of rural America. In the Forest Service, rural development will be accomplished through partnerships.

Forest Plan Objective 801. Through the Forest Service’s “Strategic Plan for the 90s,” provide leadership in working with rural people and communities to develop natural resource-based opportunities and enterprises that contribute to the economic and social vitality of rural communities.

Forest Plan Objective 802. Promote sustainable development in cooperation with local, county, State, and American Indian partners.

Forest Plan Objective 803. Recognize the nature and extent of local economic dependencies on National Forest activities. Give special attention to resource programs that help diversify rural economies.

Forest Plan Objective 804. Coordinate with local communities to recognize local goals to maintain desired life styles and social values to participate with and provide appropriate assistance to development groups, and to be a reliable partner in giving sufficient advance notice about potential changes that may affect local economies.

Forest Plan Objective 805. Utilize human resource programs to achieve employment opportunities while meeting natural resource objectives. Provide human resource programs for 208 enrollee-years each year including the Job Corps and the Senior Community Service Employment Program.

Methodology

As part of the current analysis, a review was performed of previous Forest Service travel management NEPA analyses, Forest Service technical references, and internal and external research reports. A limited range of trend estimates exist for the study area and are included or referenced in this section.

This analysis focuses on the social and economic concerns related to the travel management proposal:

Issue 4: Social and Economic Concerns. The alternatives considered in the DEIS may affect the economic sustainability of local businesses and communities. Effects may be related to sound level (noise), dust (air quality), trespass and access to private property, distance from motorized routes to private land, traffic levels, and miles of routes open to motorized use. The following are the indicators used to analyze this issue (also see recreation and transportation sections for additional discussion).

Indicators

- Miles of motorized routes within 0.5 mile of a nonmotorized trail
- Miles of NFS motorized routes through or within 300 feet of lands outside the National Forest
- Number of motorized trailheads within 3 miles of a gateway community
- Miles of motorized routes

Assumptions

- A sound emission limit for ATVs and motorcycles will be established and enforced at 96 DB(A) using the SAE J-1287 measurement Standard. Implementation of this feature may require a Forest special order.
- Current Forest funding resources will be augmented to the extent necessary to develop and maintain a resulting transportation system by fees, grants, partnerships, and cooperative agreements.
- Roads and trails will be adequately signed to show their designated use and be in accordance with the motor vehicle use map.
- Law enforcement activity, voluntary compliance, and active public information efforts will result in the recreating public complying for the most part with the modes of travel designations to be established by this decision and as published on the upcoming Motor Vehicle Use Map.

Affected Environment

Study Area

The social and economic analysis includes seven counties within the study area: Crook and Weston Counties in northeastern Wyoming; and Custer, Fall River, Lawrence, Meade, and Pennington Counties in southwestern South Dakota. This resource report summarizes community information presented in the Final EIS for the Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the Black Hills National Forest (USDA Forest Service 2005a). The Forest Plan should be referred to for additional social and economic information.

Social Elements

Social elements that highlight the lifestyle, quality of life, economy, and level of interest and issues associated with Forest management are summarized in the social affected environment section in the Phase II FEIS (USDA Forest Service 2005a), which includes a description of each county in the study area.

Population

The structure of the area's population can influence the ability of the area to absorb or adapt to changes. It is important to consider any potential changes within the context of trends that are occurring outside forest planning activities. The FEIS for the Phase II Amendment to the 1997 Forest Plan (USDA Forest Service 2005a) presented information on population for the seven counties in the Black Hills. The Phase II FEIS provides information on population by county using the 1990 and 2000 Census (Figure 9).

From 1990 to 2000, the populations of South Dakota and Wyoming grew by 58,840 (8.5% change) and 40,194 (8.9% change), respectively. At an annual rate, this represents an increase of less than 1 percent in both states (Olson 2006). The 2007 population of South Dakota was ranked 46th in the nation at 796,214 (BEA 2008). The 2007 population of Wyoming was 522,830, ranking 50th in the nation (ibid.). Decelerating and steady population growth is expected in Wyoming throughout the next 10 years (Lui 2007).

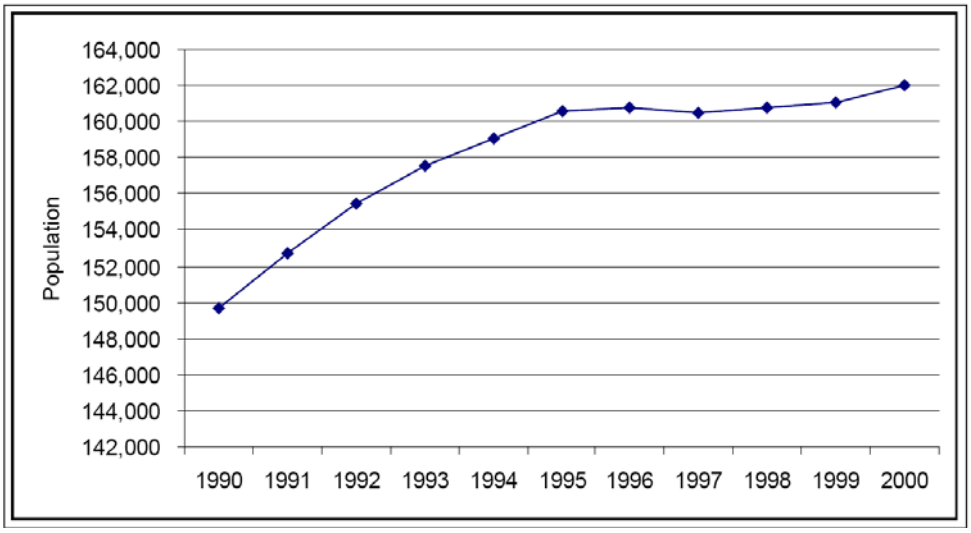

Figure 9. Total population for the seven-county study area, 1990 – 2000 (Source: U.S. Department of Commerce 2002)

OHV Demographic Characteristics

This section briefly describes the demographic characteristics of OHV recreation in the study area. In February of 2008, a research report (USDA Forest Service 2008b) in the Internet Research Information Series (IRIS), titled *Off-Highway Vehicle Recreation in the United States and its Regions and States: An Update National Report from the National Survey on Recreation and the Environment (NSRE)*, was published to provide statistics describing OHV recreational use and users in the United States.

The IRIS report describes the "population size, percent of U.S. population, sample size, OHV participation rate, estimated number of OHV participants, and the proportion that each state

contributes to the national total of 43 million OHV users." Of special interest to the Black Hills study area, Wyoming has the highest participation rate by percentage (34.3%) of population in the nation. South Dakota is in the top 10, listed as number 8 (27.0%).

The user demographic characteristics were divided into five major regions of the country, North, South, Midwest, West, and Pacific. South Dakota was considered to be in the Midwest region. The IRIS report states "Twenty-one percent, or 3.2 million of the Midwest's 15.4 million residents, participated in OHV recreation." Wyoming was included in the West region, which was described as having the highest OHV participation rate (28 percent) of all the regions.

The IRIS report further indicates that OHV users participated in 47 other outdoor recreation activities. As a whole, OHV users were found to be more active in other outdoor recreation activities than OHV riding, relative to the general population, age 16 and older. For some activities, OHV users were reported to participate at more than twice the national rate. In particular, OHV users were about three times more likely to participate in the three types of hunting (big game, small game, and migratory bird) than was the general public. The 2008 update to the National Visitor Use Monitoring project reflects that only 1.9 percent of National Forest recreational visitors listed their primary activity as OHV use (USDA Forest Service 2008c).

Environmental Justice

Executive Order 12898 directs federal agencies to focus attention on human health and environmental conditions in minority communities and low-income communities. The purpose of the executive order is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

In the Phase II FEIS, Tables 3-59 and 3-60 highlight the demographic statistics for identifying potential communities of concern. None of the counties in the study area contain low-income or minority populations as defined by Executive Order 12898. No additional outreach or analysis has been performed, as there will be no disproportionate negative effect on such communities under any of the alternatives.

Sound Levels (Noise)

An increasingly important issue in the Black Hills and across the nation is the sound level associated with off-highway vehicles. Feedback resulting from requests for comments here in the Black Hills has indicated concerns from nonmotorized users and adjacent landowners about sound levels as OHV motorized recreation use grows. The Forest Service does not currently have a stationary sound limit for the Black Hills. There is an industry standard applied to many OHVs for the sound level produced by the machines when manufactured. However, because of aftermarket changes and deterioration of mufflers with use, many of those machines exceed the original equipment manufacturer (OEM) levels. The sound level of some machines has produced a negative attitude toward some OHV recreation (see transportation section).

Air Quality (Dust)

Air quality impacts from NFS roads are associated with vehicle emissions and dust from traffic on unpaved roads. These effects typically are localized and temporary, and their extent depends on the soil types, moisture levels and the amount of traffic. Most of the unpaved ML 3 and 4 roads under Forest jurisdiction are located in unpopulated areas with relatively low traffic

volumes. Dust issues on ML 2 roads typically are less severe. Dust abatement is a relatively expensive activity and is dependent on budget levels and priorities. Historical budgets have not been sufficient to support other than minimal abatement activities on roads with high logging truck activity. Concentrating motorized use on roads and trails, and developing trailheads can potentially increase the amount of dust created in some areas (see transportation section).

Trespass and Access

According to the Travel Management Rule, areas and routes not designated on the motor vehicle use map will be closed to motorized use. This would be a change from the current situation on the Black Hills National Forest that allows motorized use unless designated as closed. The alternatives include the following elements:

- Limiting highway-legal-motorized-vehicle use to high-speed roads suitable to passenger cars, low-speed roads suitable to high-clearance vehicles, and motorized trails.
- Limiting non-highway-legal-motorized-vehicle use to high-speed roads suitable to passenger cars, low-speed roads suitable to high-clearance vehicles, and motorized trails.
- Cross-country motorized vehicle use in most areas currently open to motorized vehicles would be prohibited.

Problems related to OHV use that have developed or intensified over the last several years include noise disturbance to nearby residences, proliferation of trash on the land, traffic through residential neighborhoods, trespass onto adjacent ownerships, no legal public right-of-way access to some areas of the Forest, and damage to sensitive plant communities and riparian areas.

Economic Elements

Economic elements are summarized in the economic affected environment section in the Phase II FEIS (USDA Forest Service, 2005a), which includes a description of employment, income, recreation, and tourism.

Within the study area, only Wyoming has completed a statewide survey and economic assessment project focusing on what the study refers to as off-road vehicle (ORV) [1] use (Foulke 2006). OHV use has profound implications for public land managers, small businesses, and rural homeowners. The intent of the Wyoming survey was to provide a better understanding of the impacts associated with ORV use and assist land managers in future ORV-related planning.

Wyoming instituted an ORV permit program in 2002. In order to better serve trail users, Wyoming provided project funding to the University of Wyoming to conduct a broad-based economic assessment of ORV use in Wyoming. The project estimated the economic contribution of ORV use to Wyoming's economy. The estimate was based on a mail survey of a random sample of approximately 1,000 resident and 1,000 non-resident purchasers of 2004 ORV permits. In addition, a random-digit-dial survey of over 600 Wyoming households was conducted. The results of both surveys were analyzed and used to estimate the extent of ORV use in Wyoming and the economic impact of ORV use on the state's economy. This was the first project to collect socio-economic data focused solely on ORV use in Wyoming.

[1] The State of Wyoming has used the term ORV in its Off-Road Recreational Vehicle Act and program. This document may use the term ORV in those contexts, but for purposes of consistency will generally use the term off-highway vehicle (OHV) to describe all such vehicles. The terms are synonymous.

The survey results indicate that ORV use in the State of Wyoming is widespread and virtually a year-round activity. Based on the approximately 150,000 ORVs in the state, residents spent over $189 million on ORVs and related expenses in a 12-month period. During the same period, non-resident ORV users spent an estimated $8.4 million in the state. The project results also show that an estimated 679 new jobs and almost $18 million in potential earnings are contributed to the state's economy by non-resident ORV users. State and local government also benefit from ORV expenditures of approximately $18.5 million in sales tax, gasoline tax, lodging tax, and permit fees.

Another interesting aspect of the survey focused on the multi-use nature of ORVs that lends them to use in other activities. The primary activity was not necessarily riding ORVs solely for that experience, but rather as part of participation in hunting, fishing, and other recreational activities. Wyoming residents indicated that if ORV use were restricted, they would simply shift to another outdoor recreational activity. This response appears to be supported by the previous discussion relating to the IRIS report (USDA Forest Service 2008b) and the National Visitor Use Monitoring project (USDA Forest Service 2008c). However, non-residents indicated that, given similar restrictions, they would stop coming to Wyoming and pursue ORV opportunities in another state. This would result in a potential loss of tourism related dollars to Wyoming's economy (Foulke 2006)."

It is uncertain if the Wyoming ORV survey and economic assessment project results can be applied to the entire Black Hills study area, which also includes Forest land in South Dakota. An economic assessment survey similar to the one conducted in Wyoming is in the planning stages for South Dakota, but it is unlikely that it will be completed prior to the Forest's travel management decision, currently scheduled for late 2009.

Employment and Income

Employment is important to consider because one of the main functions of a region's economy is to provide jobs for residents. Personal income measures the dollars that area residents have to spend and save. The general trends in employment and income of a region put the potential impacts of changes in forest management in context of current trends and changes. In this section, general trends are outlined along with specific trends occurring in those sectors, primarily in recreation and tourism, likely to be most affected by changes in Forest Service management.

Recreation and tourism activities are an important part of the study area economy. Defining tourism is a difficult task as the outputs associated with the industry are more abstract than extraction or manufacturing industries. Tourism is not a single sector that can be looked at for trends – activity occurs in many sectors, often the same sectors in which local residents purchase goods and services for their own use, adding to the complexity of the evaluation.

Several measures can be used to highlight the current tourism activity in the study area. Foulke (2002) states "Probably the most direct indicator of the tourism industry is hotel and lodging. While only part of the expenditure, it most directly reflects the industry since a majority of visitors will need overnight accommodations." Sales taxes associated with lodging as well as food services can be used as a proxy of tourism trends in an area. Because the study area counties are in two different states, direct comparison among counties is difficult, but general trends can be highlighted.

The majority of employment and income in South Dakota and Wyoming is nonagricultural. Wyoming's total job growth rate of over 5 percent, recorded in December 2006, was the highest in the country. The energy industry contributed approximately one third of both the state's total earnings growth and job growth (Lui 2007). Wyoming's per capita income growth rate of 9 percent recorded in 2006 was the highest in the nation. The $40,655 of per capita income in 2006 also earned Wyoming a rank of sixth in the nation. With a growth rate of 6.3 percent between 2006 and 2007, Wyoming is still ranked sixth in the nation with a per capita income of $43,226 (BEA 2008). In 2006, South Dakota ranked 38th, with a per capita income of $32,030. With a growth rate of 5.9 percent between 2006 and 2007, South Dakota's rank increased to 34th with a per capita income of $33,905 (ibid.).

Forest Contribution

The Forest is currently studying the feasibility of initiating a Trail Ranger Volunteer Program to assist in the management of an OHV trail system. In addition, the Black Hills National Forest Advisory Board is currently working with the Forest to develop recommendations and a business plan for a new OHV user fee proposal.

Travel management decisions are likely to affect tourism-related sectors in the Black Hills. Direct economic impact on surrounding areas is based on users who purchase goods and services on their way to or returning from an activity on the Black Hills National Forest. The economic impact of access for mining, oil and gas, livestock grazing, and wood products activities would not be affected by the decision on this project. These impacts would be evaluated at the project level and will not be discussed further in this section.

Acceptable Uses

The Forest Service strives to offer multiple uses on National Forest System lands. Not every acre is available or suitable for every use, but there is a place for many if not most recreational uses to occur. In some cases, the Forest Service has determined that private lands are the most appropriate places for some specific activities, such as motocross tracks; however, with management and resource protection, many recreational uses can be acceptable and encouraged on forest lands. Juxtaposition of various uses can create some social values conflicts because not everyone values or is tolerant of recreational activities they may perceive as inappropriate or undesirable. These conflicts will persist unless and until the current and future uses of the forest are tolerated and accepted by all user groups.

Environmental Effects Analysis

Direct and Indirect Effects Common to All Action Alternatives

Impacts to communities from motorized access would continue under all alternatives. Implementation of any action alternative would significantly reduce the recreational opportunities currently available on approximately 864,000 acres for motorized users of the Forest. The lack of any large areas open to motorized cross-country travel may cause some OHV users to feel displaced. This feeling of displacement on the part of OHV users may result in increased trespass on lands outside of National Forest and a tendency for noncompliance with motor vehicle use map designations. The reduction in current motorized recreation opportunities and the concentration of OHV use on the designated transportation system could intensify conflicts between motorized and nonmotorized trail users, as well as private and other public landowners, due to such things as increased dust and noise. However, prohibiting motorized

cross-country travel on approximately 864,000 acres may significantly decrease user conflict, especially with hunters and other nonmotorized recreational users.

It is expected that active management of OHV use could be costly (see Engineering and Transportation section). The construction of new trails and trailheads, maintenance of trails and related facilities, education and enforcement, and the need for increased staff will likely strain already declining Forest Service budgets. The long-term successful management of the transportation system under any of the action alternatives would require user support in terms of volunteer services and user fees. Effective management of the OHV trail systems represented in Alternatives B and C would require higher levels of user support than those represented in Alternatives D and E.

Based on the IRIS report and National Visitor Use Monitoring results (USDA Forest Service 2008b and 2008c), it is unlikely that travel management decisions related to the recreational use on the Forest would cause significant changes in the larger economy. Recreational use on the Forest is increasing (see recreation section), so the economies of communities surrounding the Forest are expected to remain stable or increase under any action alternative. [Note: See Table 7 in the Comparison of Alternatives section of Chapter 2 for the miles of routes and acres open to public by indicator measure and use type.]

Alternative A – No Action

Alternative A reflects the current situation of the Forest transportation system. No additional management or changes would be implemented. This alternative does little to reduce the temptation for illegal activity or curtail the increasing incidence of resource damage. This alternative also makes no changes to achieve the desired conditions of the Forest Plan or expectations that arose from the Plan decision. Therefore, approximately 864,000 acres of the Forest would remain open to motorized cross-country travel. Because some trails do not allow motorized vehicle use, there is some level of separation of uses. However, no additional separation of uses would be implemented. Those conflicts that currently exist would likely continue under this alternative.

Alternatives B and C

Implementation of either Alternative B or C would allow for the addition of a large number of new OHV trails and roads open to both highway-legal and non-highway-legal vehicles (motorized mixed use). Some areas would remain open to motorized travel, but only for the limited purposes of dispersed camping and game retrieval. These alternatives would separate some uses and would meet Forest Plan desired conditions by creating a transportation system that allows both motorized and nonmotorized uses. Alternative C also considers adding additional motorized routes that may be necessary for creating higher-quality OHV user experiences than may be found under Alternative B.

There is an attempt to separate some uses by designing an OHV trail system to meet the desires of certain user types. The OHV trail system proposed in both alternatives includes a number of concentrated motorized use areas (CMUAs). The CMUAs would be connected by a series of motorized-mixed-use roads. However, given the finite transportation system and lack of any areas open to motorized cross-country travel, some OHV users may feel displaced. Others will enjoy the experience if the OHV trail system adequately accommodates their preferred uses. Because the system would have limits, and resource values must be maintained, many locations would have to be shared by different user types, and conflict could occur in these areas.

The attempt to balance all uses, reduce conflict, and minimize impacts to resources leads to the need to balance the volume of use with how much recreational opportunity is available. The routes with heavier use would tend to see more conflicts between users. Those areas also tend to be easier to access and/or are close to the urban interface. These alternatives attempt to clearly define user expectations for experiences by showing recreationists where the various uses would be allowed or prohibited.

Alternative D

This alternative would implement a limited, but practical OHV trail system, to meet transportation and social recreation needs. Alternative D would allow more separation of uses, but would also significantly reduce the opportunities for users of non-highway-legal vehicles, and would concentrate areas where these vehicles would be allowed. This would likely affect the recreation experience of those who are accustomed to using Forest system roads and currently open areas.

Alternative E

Alternative E reflects the current Forest transportation system, without any areas open to motorized vehicles or adding any user-created routes. There would be a significant increase in the separation of uses due to implementation of the travel management rule, primarily due to prohibiting the use of motorized vehicles in areas currently open to such use. Conflicts between users could continue, especially in areas of the Forest that have shared uses or in areas where user solitude would be disrupted by neighboring motorized activities. This alternative would also present adverse implications to the quality of the recreational experience for OHV users by designating roads in the South Dakota portion of the Forest as open to highway-legal vehicles only.

Cumulative Effects

The cumulative effects area for social and economics includes the area within and immediately adjacent to the Black Hills Forest boundary. A time scale of 5 to 15 years is based on the time over which one can expect to predict reasonably foreseeable actions.

As local communities continue to grow and as tourism continues to increase, more people will come to the Forest to visit and recreate. The easier it is for people to visit and recreate on the Forest, the greater will be the potential social and economic impacts.

In the future, demands for motorized opportunities are likely to continue to increase as OHV sales and the population increase in the Black Hills region. More trail demands would occur as more family units with young children use motorized travel as a form of recreation. Increases in fuel prices are not expected to reduce the level of OHV recreation activities, and more local residents would likely use the Black Hills National Forest for their recreation preference. The loss of OHV recreational opportunities by limiting or prohibiting cross-country motorized travel would be partially offset by the enhanced OHV trail system opportunities under Alternatives B, C, and to a limited extent, Alternative D. In addition, commercial opportunities could develop on adjacent private properties to provide cross-country areas for OHV users seeking hill-climb, motocross, mud-bogging, or rock-climbing type activities.

Changes based on economy, age distribution, and population can affect how people recreate. The population in the study area is expected to continue to grow and Forest use will likely increase. The state of the economy, gas prices, food prices, and housing costs can affect how much discretionary income people have for recreation. As the population ages, some uses may increase

in popularity while others may taper. Technological advances in equipment and trends also can affect the activities in which people choose to participate. Based on the economic and demographic forecasts for South Dakota and Wyoming discussed in this section, it appears that none of the alternatives would create any measurable cumulative social or economic effects on the Black Hills region.

Soils

Introduction

Soils of the Black Hills National Forest (the analysis area) have generally been mapped and described at an Order 3 (USDA Forest Service 1991) level[2]. General background soil resource information for the Forest is available in the Final Environmental Impact Statement for the Revised Land and Resource Management Plan for the Forest (USDA Forest Service 1996a), and in the Final Environmental Impact Statement for the Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the Black Forest (Phase II FEIS; USDA Forest Service 2005a). An extensive amount of information on various specific components for Forest soil map unit resources have been and are periodically updated (such as through the 2007 update to the Lawrence County Soil Survey) by the Natural Resources Conservation Service (NRCS) and have become available to the public through an the NRCS website located at http://soils.usda.gov/. Soil information was available for the 2007 Travel Analysis Process Report for the District route selection process and is not presented again for this Forestwide document.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

The primary law that applies to the soil resource is the National Forest Management Act of 1976 (16USC 1600-1602, 1604, 1606, 1608-1614), which directs that management prescriptions conserve the soil resource and not allow significant or permanent impairment of land productivity.

Standards, guidelines and management directives set forth in the Revised Forest Plan as amended (USDA Forest Service 2006a) include measures for the conservation and protection of the soil resource on National Forest System lands. Forest Plan standards and guidelines for the soil resource considered applicable to the travel management plan include:

1. Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded, and displaced land to no more than 15% of any land unit. (Standard 1103; see similar worded R2 Soil Management Handbook and R2 Watershed Conservation Practices Handbook direction below).
2. Minimize soil compaction by reducing off-road vehicle passes, by skidding on snow, frozen or dry soil condition or by off-ground logging systems (Guideline 1104).
3. Stabilize and maintain roads and other disturbed sites during and after construction to control erosion. (Standard 1106)
4. Maintain or improve long-term levels of organic matter and nutrients on all lands. (Standard 1109)

[2] Need definition of what Order 3 level means

No soil resource specific direction exists in Forest Plan management area direction. Forest Plan standards and guidelines for the conservation and protection of soil resource productivity apply to all management areas.

Region 2 Soil Management Direction

The Soil Management Handbook (FSH 2509.18, R2 Supplement) provides standards to ensure soil quality maintenance. The following standard applies:

> "**2.23.** No more than 15 percent of an activity area will be left in a detrimentally compacted, displaced, puddled, severely burned and/or eroded condition. This does not include the permanent transportation system."

Region 2 Watershed Conservation Practices Handbook Direction

The Region 2 Watershed Conservation Practices Handbook also provides direction with similar wording to Forest Plan standard 1103 and the R2 Soil Management Handbook. The following Management Measure 13 from that handbook applies:

> "Manage land treatments to limit the sum of severely burned soil and detrimentally compacted, eroded, and displaced soil to no more than 15% of an activity area[3] (commonly a timber sale cutting unit, prescribed fire burn unit or an allotment pasture)."

Methodology

The USDA Forest Service Region 2 Soil Management Handbook (USDA Forest Service 1992) contains direction targeted at protecting soil resources and soil productivity, which includes the inherent capacity of a soil under management to generally support the growth of specified plants, plant communities, or a sequence of plant communities. The R2 Soil Management Handbook and the WO Amendment to FSH 2509.18 Soil Management Handbook (USDA Forest Service 1991) include information that applies to areas where vegetation management prescriptions are being applied, including timber production sites and livestock forage production areas within allotments. The Region 2 Watershed Conservation Practices Handbook (USDA Forest Service 2006c) reiterates that the National Soil Handbook (FSH 2509.18) soil quality standards are intended for areas where management prescriptions are being applied, such as timber harvest areas and range allotments. They are not intended to apply to administrative sites or other areas with dedicated uses such as the designated permanent Forest transportation system. Roads, trails, trailheads and specified parking zones along routes are dedicated to a specific management use that precludes other uses of the land (such as for growing trees for harvest or forage for wildlife or livestock) and removes the majority of the productive capability of soils at the specific location where they occur. Therefore, the soils analysis is primarily focused at the various land areas in action alternatives that are designated open to cross-country motorized travel. Alternatives that contain land areas open to cross-country motorized travel off of designated transportation facilities include Alternatives A (existing condition), B, and C. Alternatives D and E restrict motorized travel to the designated transportation system facilities with no areas open for motorized cross-country travel.

[3] An **activity area** is defined as an area of land impacted by a management activity or activities. It can range from a few acres to an entire watershed depending on the type of monitoring being conducted. It is commonly a timber sale cutting unit, a prescribed fire burn unit, or an allotment pasture. Soil quality standards do not apply to administrative sites or other areas with dedicated uses, including the permanent Forest Transportation System.

The following indicators were used to measure the effects to the soil resource across the range of alternatives:

Indicators

- Acres open to unlimited motorized cross-country travel
- Acres open to limited motorized cross-country travel (motorized game retrieval, motorized dispersed camping).

Potential effects of the alternatives to the soils resource was part of Issue 1. These effects are considered in the DEIS to compare how well each alternative meets soil protection requirements. The acres open to motorized cross-country travel and the amount and timing of that use can potentially alter surface vegetation or soil conditions to a level that soil productivity at specific locations could be expected to be impacted.

Assumptions

Based on the information available in Chapters 1 and 2 of the DEIS a number of assumptions were made for the soils analysis.

- As identified, interdisciplinary teams on each of the Forest ranger districts identified routes to be included in the various alternatives. A component of the purpose and need as well as the route location selection process for the action alternatives was to identify opportunities to limit the potential for resource impacts and to select routes with the expectations that a trail system could be sustained with expected limited funding available for maintenance (see Chapters 1 and 2). Therefore, a primary assumption for the soils analysis is that a number of routes or motorized use sites contributing to soil resource impacts known by “on-the-ground” District Resource Travel Management Team specialists and through information contained within the Forestwide Travel Analysis Process Report (USDA Forest Service 2007a) were not included in the action alternatives other than in Alternative E (existing routes alternative). In addition, the assumption also includes expectations that routes included in the alternatives are to be adequate and sustainable for use in their current condition. There may be limited repairs or adjustments needed at a limited number of points to prevent unacceptable impacts from occurring to adjacent soil resources.
- For comparing alternatives, designated Forest transportation facilities for each of the alternatives are considered to cause equal amounts of disturbance to the adjacent soil resources that are not allocated to the transportation facility. While it is recognized that not all of the transportation facilities cause equal amounts of disturbance (it can vary based on slope gradients, intensity of use, timing and volume of precipitation, etc.), designated transportation facilities can be designed to meet Forest Plan standards and guidelines and Region 2 Watershed Conservation Practices (see Design Criteria in Appendix B and the management strategies list in the Implementation section of Chapter 2). Such measures would help ensure that any potential effects are within an acceptable level to protect and maintain soil productivity conditions.
- Not designating routes that currently have less than desired condition elements would likely remove from the public transportation system those routes that would be expected to require the greatest amount of maintenance. This would likely contribute to a greater effectiveness for the limited maintenance resources that would be available.
- Since the motor vehicle use map is to be updated annually (see motor vehicle use map management strategy identified under the Implementation section in Chapter 2), an annual

update would require periodic documented route reviews or inspections, as well as timely maintenance throughout the year to address and correct identified resource impacts, including any to adjacent soil resources. In addition, if inspections or reviews identified that a designated route or cross-country motorized use area could not be managed to standard (see Design Criteria in Appendix B and the management strategies identified under the Implementation section in Chapter 2), action would be taken to close the specific transportation facility or area, such as through a road closure or area closure order until a new motor vehicle use map would take effect, and the original facility or area would be reclaimed or rehabilitated.

- Administrative access (see Chapter 2 Legal Framework and General Assumptions sections) would be limited in nature (estimated at generally less than 5 vehicle passes per year) and would retain vegetative cover or allow for regrowth to the level that water runoff velocity would be at significantly lower levels as compared to a designated open transportation facility that experiences multiple passes in the same day. While administrative access for fire generally results in significant soil disturbance and removal of vegetative cover associated with fire suppression activities (such as during dozer line construction) suppression rehabilitation activities are implemented to meet Water Conservation Practices Handbook Management Measure (design criteria h) (USDA Forest Service 2006c) to limit the extent and duration of effects. Part of the burned area rehabilitation process could also be expected to include an area or route closure period, as needed, to allow vegetation of the general area to establish prior to reinitiating any OHV use.

Design Criteria

No additional design criteria specific to the soil resource were included for the action alternatives. Dedication of sites to designated routes and trailheads that incorporate the design criteria for protecting water resources and limiting the number of acres and the number of opportunities (reduced number of trips) for cross-country travel generally addresses design criteria that would have been included for meeting the Forest Plan standards and guidelines and Region 2 Soil Quality standards listed above.

Field information and Other Analysis Information

The soil resource evaluation was developed using information presented to the extended team (soils was a component of the extended team) from the core transportation management interdisciplinary team (IDT) specialists, background information from existing knowledge of the Black Hills and professional judgment.

For this analysis, effects were discussed for the Forest soil resource as a whole rather than addressed by each soil map unit across the Forest because 1) the analysis covers such a large area (Forestwide) containing a large number of soil map units, 2) we are assuming that sustainable and safe travel would be limited to specific slopes with a limited amount of use, and 3) the motor vehicle use map could change use areas on an annual basis.

Since specific research is not known to be available for the general Black Hills area, some of the most recent literature (Ouren et al. 2007) and other Forest travel management analysis documents were reviewed to understand impacts associated with OHV use in other areas. Acreage and mileage figures provided are and should be considered approximate since information included in Chapters 1 and 2 indicate that motor vehicle use maps are likely to be changed as necessary to address resource protection and conservation needs.

Affected Environment

As described in Chapter 1, approximately 4,109 miles of unauthorized OHV routes (not currently part of the designated Forest transportation facilities) currently exist on the Forest (see Alternative A map in Appendix I, map packet). These routes are generally associated with the extensive area of the Forest that is currently open to unlimited cross-country motorized travel. As indicated above, these generally were not planned routes with engineering design specified for Forest projects; therefore, effects to soil productivity were generally never analyzed. OHV trails and use areas currently occur at various concentrations and intensity of use levels throughout the Forest. In comparison to designed native surfaced roads, these unauthorized routes are generally narrower (50 inches in width or less) than roads tend to lack drainage structures, and some have been observed to occur on steep gradients (for additional information see the Transportation section of this chapter). Based on mostly undocumented observations, impacts to soil resources currently exist at various levels and locations along unauthorized routes in the open cross-country motorized use areas. In these areas, vegetative ground cover has been removed, surface soil layers have become eroded, soil structure has been altered, surface soil layers have become mixed with subsurface layers, or tracks have extended to the bedrock layer. Some trails have been observed to contribute to the concentration of water runoff associated with snowmelt or precipitation events and have contributed to erosional features (ruts and gullies) at track locations (see some of these effects featured in some of the photos located throughout the DEIS). The public can readily observe some of these motorized use areas and associated erosional features when traveling on some of the main roads or highways located throughout the Forest. Past Forest documents have included information regarding impacts to soil resources associated with OHV use on Forest lands and closure orders have been issued to reduce impacts to a variety of resources. Local newspaper articles in recent years have also reported on various OHV effects that have occurred on the Forest and the actions taken to address those effects. Some limited funds have become available periodically, which have been used to attempt to reclaim some areas, primarily focused at sites near to or that cross perennial streams (to restore some level of vegetation with the intent to reduce sedimentation).

Environmental Effects Analysis

It is important to clearly understand that reclamation or rehabilitation of previously used unauthorized user-created routes or OHV-disturbed areas across the Forest is not included as part of any of the action alternatives or as part of the decision to be made for this project; therefore, this is not addressed in the effects analysis for any of the alternatives. Those activities would only occur if proposed through other project planning processes and decisions.

The decision to allow or prohibit the use of motorized OHV on designated open routes (the Forest transportation facility) would generally be expected to have limited effects on adjacent soil resources. A route designation decision does have the potential to affect soils indirectly to the extent that it may affect the concentration of use on roads and trails. For example, increased use in some areas may result in greater levels of OHV parking on the edge of the trail, prompting the need for more routine maintenance, and affecting the potential for impacted areas to recover. In general, more motorized routes and motorized use on National Forest System lands could be expected to contribute more potential site disturbances that could impact Forest soil resources.

Based on the assumptions listed near the beginning of this section and the sites to be designated on the Forest transportation system, the greatest potential for effects to soils from motorized recreation are likely to be associated with potential disturbances from areas used for dispersed camping, followed by areas open to game retrieval. While expected to be very limited, the

potential increase in water runoff velocities from designated facilities can potentially contribute to erosion of soil resources located immediately adjacent to transportation facility components. Therefore, the amount of area open to motorized cross-country travel is the overriding indicator used to evaluate the level of effects to soils, with some minor considerations given to designated transportation facilities.

Direct and Indirect Effects

Alternative A - No Action

Indicators

- Acres open to unlimited motorized cross-country travel: 864,000
- Acres open to limited motorized cross-country travel (motorized game retrieval, motorized dispersed camping): 864,000

This alternative retains the current 864,000 acres open to motorized unlimited cross-country travel, which occurs throughout the entire year. While 864,000 acres is what is “mapped” it is somewhat misleading regarding what can be expected for potential site and soil disturbances created by OHV use. OHV use would likely occur on less than 864,000 acres because accessibility is restricted due to natural or human-developed barriers (vegetation, steep slopes, rock outcrops, private land and Forest fences, lakes or other water features, etc.) No changes to cross-country motorized dispersed camping and motorized game retrieval would be expected.

This alternative would be expected to have direct and indirect effects similar to some conditions that have been observed on the Forest to date (see those discussed in the Affected Environment section above) and what has been documented from elsewhere (Ouren et al. 2007). Unregulated off-road motorized activities can contribute to disturbed conditions that can result resulting in unacceptable levels of soil degradation. A variety of effects associated with OHVs, including those to the soil resource, has been compiled and published (Ouren et al. 2007). Abrasion removes surface vegetation and roots, which can further contribute to water runoff and erosion. Compaction reduces soil voids to various degrees, which can result in limitations to various site productivity factors such as the water-holding capacity of the soil or restricting or altering vegetative root growth (USDA Forest Service 2006c). Any potentially new or existing unauthorized roads and trails in Alternative A would likely continue to contribute to the spread of invasive weed species (see the Noxious Weeds section). Various invasive non-native competitive plant species including cheatgrass are generally recognized to be less valuable at preventing or limiting soil erosion than plant species native to an area.

Depending on the level of use and various site conditions that exist along routes, uncontrolled motorized vehicle use off roads and trails can alter soil conditions in areas that are not part of the permanent transportation system and contribute to a lowered soil productivity condition than what would generally occur naturally at a site. As compared to a designed or designated open system, unauthorized roads and trails have greater potential for more impacts to soils due to lack of design and placement in a specified location.

While direct and indirect effects would be expected to continue under the no action alternative, closure orders would still be a tool for closing areas where resource damage occurs.

Effects Common to all Action Alternatives

The Region 2 Watershed Conservation Practices Handbook Management Measure 13 addresses soil quality as follows:

> "Manage land treatments to limit the sum of severely burned soil and detrimentally compacted, eroded, and displaced soil to no more than 15% of an activity area (commonly a timber sale cutting unit, prescribed fire burn unit or an allotment pasture)."

While slightly different (since it was based on a previous version of the Region 2 Watershed Conservation Practices Handbook Forest Plan standard 1103 has similar wording:

> "Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded and displaced land to no more than 15% of any land unit."

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While slightly different (since it was based on a previous version of the Region 2 Watershed Conservation Practices Handbook), Forest Plan standard 1103 has similar wording:

> "Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded and displaced land to no more than 15% of any land unit."

Although the R2 Watershed Conservation Practices Handbook management measure, the R2 soil quality standard and Forest Plan standard 1103 are primarily targeted at timber, prescribed fire, and range activities, it is also applicable to other human disturbance activities on Forest land. Components of the action alternatives can be expected to benefit or potentially contribute to reducing detrimental soil quality conditions that currently exist and would continue under Alternative A. The action alternatives would significantly limit or eliminate all acres open to motorized cross-country travel; but quantitative benefits are immeasurable at a Forest scale. However, the decrease or elimination of areas available for motorized cross-country travel and the designation of specific routes open for public wheeled-motor-vehicle use would concentrate use to designated sites and would comply with design criteria 1 (a) of Management Measure 13 (USDA Forest Service 2006c):

> "Restrict roads, landings, skid trails, concentrated-use sites, and similar soil disturbances to designated sites."

Designating the greatest amount of OHV use to Forest transportation facilities and to specific use areas would implement that design criteria. While concentrated use along designated transportation routes could contribute to some effects (such as increasing water runoff velocities that could cause erosion on adjacent soils), specifying designated routes, trailheads and parking zones, could lead to sustainable maintenance and soil protection standards specified for transportation facilities (see Chapter 2 of the DEIS). At this time, the amount of maintenance an open route would require and receive in the future is unknown; however, an increase in annual maintenance opportunities and levels would help address and limit effects of concentrated use and keep it within a manageable level.

The designation of trailhead facilities (estimated at up to five acres in size for this analysis) would further implement that design criteria. Trailheads are generally expected to occur on slopes of 5 percent or less to provide for ease of parking trailers and the loading and unloading of OHVs. The numbers of trailheads are 34 in Alternative C, 31 in Alternative B, 23 in Alternative

D, and 7 each in Alternatives A and E. Even at five acres, the total acreage trailhead designation would be less than 200 acres that could contribute to water runoff to contribute to any effects to adjacent soil resources. By actually designating such facilities, concentrated OHV loading and unloading can be limited to specific locations with the expectation that the facilities can be maintained to specific standards (see Design Criteria in Appendix B and the management strategies identified under the Implementation section in Chapter 2) with a greater likelihood of preventing impacts to adjacent soil resources.

Mass movement of land surfaces have occurred on the Forest with generally the greatest potential for occurrence in the Bear Lodge Mountains. The geology of some areas in the Bear Lodge Mountains have characteristics that contribute to a greater likelihood of naturally occurring failures on steep slopes or human-caused failures in association with site disturbances such as highway and road construction or vegetation removal activities. It is important to note that soil displacement in the form of mass movement (also known as slope failures or landslides), has not been observed to occur on the Forest with cross-country motorized use. Mass movement increases as identified in the R2 Soil Quality Handbook, R2 Water Conservation Practices Handbook, and in Forest Plan standard 1103 are not expected to be an issue since no roads would be designed or constructed as part of this decision. Designation of transportation facilities in the Bear Lodge Mountains under any of the action alternatives is not expected to increase the likelihood of mass movement. The only routes to be designated under any of the action alternatives are located on existing routes that currently have some level of drainage features designed into them. No user-created routes were included as designated open routes within the alternatives for that portion of the Black Hills National Forest. In addition, removal of timber canopy is not a part of the activities or decision to be made for this project. Therefore, mass movement potential is not expected to increase or decrease as part of this project.

When wet, various native surface roads and trails with low strength characteristics[4] can be susceptible to rutting. Rutted conditions can result in a desire by users to circumvent the designated transportation facilities and to access areas not designated as open on the motor vehicle use map. Rutted conditions have been observed to contribute to trail widening as vehicles avoid the rutted trail locations, and can result in unacceptable impacts to the transportation surfaces or drainage features and limit their effectiveness (see the transportation report for further information), resulting in concentrating water runoff that can lead to varying levels of gully erosion depending on site characteristics. If rutting of routes occurs, the assumption is that maintenance of designated routes would occur in a timely manner according to protective standards, and users would not feel the need to divert off the route where soils would be impacted. Therefore, effects to adjacent soil resources would be kept at a minimum level.

Effects Specific to Alternative B

Indicators

- Acres open to unlimited motorized cross-country travel: 0
- Acres open to limited motorized cross-country travel (motorized game retrieval, motorized dispersed camping): 177,000 (approximately 14% of NFS lands)

[4] low strength characteristics can be obtained from the NRCS Soils website at http://soils.usda.gov/technical/manual/contents/chapter6a.html#1

Based on the assumptions listed earlier and the indicators above, this alternative can be expected to have some of the same direct and indirect effects as those in the no action alternative but to a much lesser degree. The greatest potential for effects to the soil resource under this alternative from motorized recreation is likely to be associated with potential disturbances from areas used for dispersed camping, followed by areas open to game retrieval.

Motorized game retrieval can affect soils through disturbance of vegetation. However, under this alternative, very few or no effects to the soil resource would be expected. Only one vehicle is allowed for a retrieval of a harvested animal although more than one pass by the vehicle is allowed, only as needed, and no resource damage is allowed for the retrieval of an animal (see game retrieval information provided in Actions Common to All Action Alternatives Section in Chapter 2). Based on the size of the animal, it can generally be assumed that only a single entry would be needed to retrieve a deer. Since elk are larger animals, it may be possible, depending on the size of the OHV available, that up to four passes may be needed for a small vehicle to retrieve an elk (one quarter of the animal per pass), while a larger vehicle may only need one entry. Therefore, since the number of passes to retrieve an animal would generally be four entries or less, such a level of use would have limited potential for causing altered soil condition t that would impact soil productivity conditions of a site. In addition, game retrieval would generally be limited to less than five months a year (September through January), during a period when soil moisture conditions are generally lower than what occurs during higher precipitation months or frozen conditions may be present (climate information for Black Hills can be viewed by following the links provided by the High Plains Regional Climate Center at http://www.hprcc.unl.edu/). The hunting period is also at the end or after the growing season period for most plants. Based on the soil moisture conditions at this time of the year and the entry limitations to retrieve game, there would be a very limited potential to no likelihood of soils to be compacted to a detrimental level in areas open to that activity. In addition, the entry limitation during the hunting season would result in little to no observable reductions of vegetative ground cover, or reduce ground cover to the point below that expected to keep erosion within tolerable limits (approximately 50 to 70 percent for soils within the Black Hills).

Recognizing that natural and human restrictive features and conditions prevent access to some of the areas open for motorized cross-country travel, it is likely that fewer acres than the total listed will be accessed. For example, in considering slope, an assumption can be made that there may be hunter safety concerns and that there are limitations to the stability of vehicles on certain slopes. Slopes of various soil map units were reviewed through a geographical information system (GIS) query. While it is likely that the general hunting public would probably limit motorized removal of big game to slopes of 15 percent or less, there may be some people that operate their vehicles on steeper slopes; therefore, an even greater conservative query was reviewed. Simply based on eliminating soils with slopes of 30 percent and greater, game retrieval acreage for Alternative B would generally be less than 161,000 acres (approximately 13 percent of the Forest). An assumption is that the total acres that would actually be accessed for game retrieval would be even further limited by site factors that are not as easily mapped. These restrictive features can include rock outcrops, soil surface rock fragments or boulders, dense understory shrub conditions, private land fences limiting access to public lands, lakes and other water features, or some other site condition that would limit the desired or safe operability of motorized OHV equipment. Based on the information available and presented, risk of impacts to a detrimental level for soils associated with game retrieval as is specified in Alternative B is considered to be at a low level.

As mentioned above, motorized use off of designated routes can disturb vegetation, which could contribute to some impacts to soils. Motorized dispersed camping is associated with access to and from trails and parking, which can disturb vegetation and in turn can contribute to effects to soils. The total amount of acres actually available for dispersed camping (observations in recent years is that the majority is of a motorized nature), and considered to be more desirable for camping, is significantly less than the total of what is listed for each alternative. Based on site-limiting factors not conducive for locating or setting up campsites, a primary and easily mapped feature is slope, which limits the use of a variety of camping equipment and camper comfort (the assumption is that the majority of motorized or pull type campers or camping equipment would generally access and set up on areas of off-road slopes of 10 percent or less). Recognizing there may be a very limited number of campers that may actually access slopes greater than 5percent, a query of soil map units of less than 10 percent slope was made to estimate the majority of acres where motorized dispersed camping and access would be expected to occur. The review of that query indicates that only about 1/3 of the total acres listed as available to motorized use could or would likely be used under Alternative B with that use identified (less than 24,000 acres or 2 percent of the Forest). The percentage of the Forest desirable or available for motorized camping would likely be even significantly less based on a number of other site factors, which are generally not as easily mapped as slope, but have been observed. Other factors that limit the desirability or limit the conditions of site suitability for motorized camping can include rock outcrops, soil surface rock fragments or boulders, presence of poison ivy, presence of various noxious weeds (such as Canada thistle), dense understory shrub conditions, high tree stem densities, private land fences, presence of Forest livestock and odor of livestock excrement, road noise, and presence or lack of surface water.

Total acres of motorized cross-country travel can not be calculated by adding game retrieval and motorized dispersed camping acres for Alternative B. Motorized dispersed camping in Alternative B is included entirely within areas where game retrieval is identified; therefore, total acres of all cross-country travel for Alternative B is 177,000 acres (approximately 14 percent of National Forest System lands). The existing condition (or the no action alternative) currently allows season-long, unlimited motorized cross-country travel activities on 864,000 acres (approximately 70% of National Forest System lands). The reduction in the percentage of the Forest open to motorized cross-country travel in Alternative B identifies the level of potential benefits that can likely be realized to various areas of Forest soil resources. In addition, significantly fewer passes by motorized vehicles would be expected to occur on those lands.

Areas designated as part of the permanent transportation facility are no longer managed as a soil resource and therefore were not used as an indicator. If the permanent transportation facility components (considered to be the routes designated, the adjacent parking zones along the routes, and the trailheads) are managed to the standard specified in Appendix B and discussed in the hydrology section of this DEIS, any indirect effects associated with the routes to adjacent Forest soil resources are expected to be very limited in spatial extent. Implementation of Alternative B would have approximately half as many miles used by motorized vehicles as compared to the existing condition (Alternative A, no action).

Effects Specific to Alternative C

Indicators

- Acres open to unlimited motorized cross-country travel: 0
- Acres open to limited motorized cross-country travel (motorized game retrieval, motorized dispersed camping): 473,600 (approximately 39% of NFS lands)

Based on the assumptions listed earlier and the indicators above, this alternative can be expected to have some of the same direct and indirect effects as those in the no action alternative but to a much lesser degree. The greatest potential for effects to the soil resource under this alternative from motorized recreation is likely to be associated with potential disturbances from areas used for dispersed camping, followed by areas open to game retrieval.

Direct and indirect effects of game retrieval in Alternative C would be similar to those identified and discussed under Alternative B, but could be expected to occur over a larger area since more acres would be available and a greater potential for more game-retrieval-entry opportunities. The same GIS slope query exercise used in Alternative B was used for Alternative C analysis. The results indicate that less than 325,000 acres (approximately 26 percent of the Forest) would be available for motorized game retrieval. Alternative C differs from B in that it allows game retrieval off of the designated Forest transportation system for both elk and deer (deer have far more tags available than elk); therefore, not only does Alternative C have more acres available for big game retrieval as compared to Alternative B, more cross-country motorized entries can be expected in Alternative C as compared to Alternative B, which has elk-only game retrieval specified (see the Wildlife Section for additional information). While more opportunities are at a greater potential for risk of effects to the soil resource based on acres and more entries as compared to Alternative B, the other information presented in Alternative B would also indicate that risks of detrimental impacts to the soil resource would be low for Alternative C if game retrieval would be implemented to the standard specified for that alternative.

Direct and indirect effects for dispersed camping in Alternative C would be similar to those identified and discussed in Alternative B but would occur over a slightly larger area since more acres are available for that recreational activity in Alternative C. A similar GIS query was completed for Alternative C as to the query that was completed for Alternative B to indicate the amount of acres that might actually be used for dispersed camping. Similar to Alternative B, the review of that query indicates that only about 1/3 of the total acres listed as available to motorized dispersed camping use would likely be used in Alternative C (less than 58,000 acres or approximately 5 percent of the Forest). As with Alternative B, within even those acres, desirable or available camping would likely be even significantly less based on a number of other site factors listed in the discussion for Alternative B above, which are generally not as easily mapped as slope, but have been observed. Based on that information, less than 5 percent of the Forest for the implementation of Alternative C would likely be used for motorized dispersed camping if Alternative C were implemented. Of the action alternatives, Alternative C would have the greatest number of acres likely to be used for motorized dispersed camping, followed by Alternative B.

As with Alternative B, total acres of motorized cross-country travel for Alternative C cannot be calculated by adding game retrieval and motorized dispersed camping acres together. Unlike Alternative B, motorized dispersed-camping areas are not entirely inclusive in the game retrieval areas of Alternative C; however, there is some overlap resulting in a total area of 473,600 acres (approximately 39 percent of National Forest System lands) available for specific, limited motorized cross-country activities. As compared to the existing condition, the percentage of the Forest open to motorized cross-country travel in Alternative C would be reduced by 30 percent, resulting in potential benefits to various areas of soil resources. In addition, fewer passes by motorized vehicles would be expected to occur on these lands.

Areas designated as part of the permanent transportation facility are no longer managed as a soil resource and therefore were not used as an indicator. If the permanent transportation facility

components (considered to be the routes designated, the adjacent parking zone along the routes and the trailheads) are managed to the standard specified in Appendix B and discussed in the hydrology section of this DEIS any indirect effects associated with the routes to adjacent Forest soil resources are expected to be very limited in spatial extent. Like Alternative B, implementation of Alternative C would have approximately half as many miles used by motorized vehicles as compared to the existing condition (Alternative A, no action).

In addition, various seasonal closures are identified associated with big game winter range or goshawks (see design criteria in Appendix B and the alternative maps in Appendix I, map packet). Both seasonal closure periods overlap with all or portions of the season when the greatest precipitation is generally experienced (High Plains Regional Climate Center information indicates this as the beginning of April until the end of June) and soil moisture is generally at some of the highest levels of the year. While uncertain, there could be additional benefits to the soil resources adjacent to routes with seasonal closures as compared to routes that are designated open year round. Seasonally closed routes may experience some vegetative growth during closure periods, thereby contributing to limiting water runoff velocities, which in turn would contribute to reductions in erosional forces on adjacent soil surfaces located downslope of transportation facilities.

Effects Specific to Alternative D

Indicators

- Acres open to unlimited motorized cross-country travel: 0
- Acres open to limited motorized cross-country travel (motorized game retrieval, motorized dispersed camping): 864,000

In this alternative, no motorized game retrieval off of motorized routes or dispersed camping would occur; therefore, no impacts to the soil resource associated with these activities would be expected.

Areas designated as part of the permanent transportation facility are no longer managed as a soil resource and therefore were not used as an indicator. If the permanent transportation facility components (considered to be the routes designated, the adjacent parking zone along the routes and the trailheads) are managed to the standard specified in Appendix B and discussed in the hydrology section of this DEIS any indirect effects associated with the routes or other designated transportation facilities to adjacent Forest soil resources are expected to be very limited in spatial extent. Implementation of Alternative D would have about 40 percent of motorized use route miles as compared to the existing condition (Alternative A, no action).

Effects Specific to Alternative E

Indicators

- Acres open to unlimited motorized cross-country travel: 0
- Acres open to limited motorized cross-country travel (motorized game retrieval, motorized dispersed camping): 864,000

In this alternative, no motorized game retrieval off of motorized routes or motorized dispersed camping would occur; therefore, no impacts to the soil resource associated with these activities would be expected.

Areas designated as part of the permanent transportation facility are no longer managed as a soil resource and therefore were not used as an indicator. If the permanent transportation facility components (considered to be the routes designated, the adjacent parking zone along the routes and the trailheads) are managed to the standard specified in Appendix B and discussed in the hydrology section of this DEIS any indirect effects associated with the routes to adjacent Forest soil resources are expected to be very limited in spatial extent. Implementation of Alternative E would have the same number of designated routes of NFS lands open for motorized use as the existing condition and no action alternative, but none of the unauthorized routes would be open to motorized use in Alternative E; therefore, Alternative E would have approximately 46 percent of the route miles as compared to the existing condition (Alternative A, no action).

Cumulative Effects

The geographic scope of the cumulative effects analysis selected is the entire Forest. Some general similarities exist in soils and climates within this area that are within the Black Hills. A larger area would include the surrounding lower elevation plains areas outside of the Black Hills, but these include a different suite of soils and climatic conditions. A temporal scale of 10 years was used and is based on (1) the time over which one can expect to predict reasonably foreseeable actions and (2) the time over which one can expect to predict effects of ongoing and proposed activities.

The cumulative effects analysis for the soils resource generally considers impacts of the alternatives when combined with the following past, present, and foreseeable future actions and events including: (1) designated Forest transportation facility maintenance; (2) closure or rehabilitation efforts on routes not open for public use or not maintained for administrative use; (3) vegetation treatments; (4) urban interface growth and increased Forest use; and (5) future road or trail realignment, reconstruction, or decommissioning. Management actions can contribute to alterations in user concentrations, creation of unauthorized routes, maintenance needs and levels, the effectiveness of closures, and rehabilitation or some level of recovery of closed routes. Cumulatively, these actions can influence vegetative growth and soil erosion.

The designation of a transportation system does not limit the ability of the Forest to use closure orders for areas where unacceptable resource damage is identified. This important management tool can limit the duration and extent of effects if resource damage is beginning to occur. Effects to the soil resource, such as soil erosion features being present, may be reason for the implementation of this tool if corrective maintenance is not successful.

Some erosional or drainage issues have periodically been identified for Forest transportation facilities and may be tied to inadequate design, maintenance, inspections or repairs, or from a climatic event (USDA Forest Service 2007a). Roads that are regularly used, such as those used for timber entries, are generally inspected and maintained according to timber sale contract specifications. Other transportation facilities on the Forest are assigned a maintenance level and follow a Forest maintenance schedule (refer to the Transportation section of this Chapter). Various portions of the Forest experienced high-intensity precipitation events in 2008. The volume of water was to the level that floodplains and components of the Black Hills transportation system (both Forest and other systems) were flooded and impacted and various Black Hills communities closed roads, both for human safety and repair needs. Transportation facility inspections conducted on the Forest noted slope failures, washouts, and other damage associated with the high-intensity precipitation events. The assumption for this analysis is if there are similar future precipitation events, there would likely be similar maintenance and repair

implementation, or temporary route closures for Forest motorized trail and trailhead facilities since they will be designated as part of the Forest transportation system.

The Forest-urban interface in the vicinity of Rapid City is one of the most rapidly growing areas in the State of South Dakota. The rapid population growth has likely contributed to the popularity of all-terrain vehicles and the demand for this type of motorized recreation can be expected to continue to increase (see Chapter 1). Therefore, it is likely that demand would concentrate or use levels would increase on open routes within this general area. Areas with concentrated use will wear on drainage structures, which could contribute to increased erosion and deposition of material on adjacent soil resources. However, the assumption is that by reducing the number of routes inspections would be timely and maintenance would occur soon after an issue was identified and any impacts to adjacent Forest soil resources would be kept to a minimum.

Following this travel management decision, and potentially concentrating use, there may be a need to reroute or rehabilitate some routes. Rehabilitation and relocation activities typically results in some level of soil disturbance. However, the long-term effects of rehabilitation actions would likely contribute to reducing impacts to soil resources, by reducing the potential for soil erosion of a site. If a rehabilitation project would be determined to consist of something other than routine maintenance of a designated transportation facility, environmental analysis specific to the rehabilitation is expected to occur.

A variety of activities, such as vegetation management activities, recreational activities and other management activities are expected to continue on the Forest. Road construction, reconstruction, and decommissioning as part of managing the Forest designated transportation system are expected to continue to move towards Forest Plan Objective 309 (USDA Forest Service 2006a). As identified in previous documents, these activities would likely have various levels of effects to soils as identified in the Forest Plan EIS (USDA Forest Service 1996a) and in the Phase II Amendment EIS (USDA Forest Service 2005a).

As indicated in the Direct and Indirect Effects section above, implementation of any of the action alternatives (B, C, D and E) would be expected to significantly reduce the amount of area open to cross-country travel as compared to Alternative A. No rehabilitation of unauthorized routes or other disturbed areas associated with OHV use within areas not to be designated open is included in any of the action alternatives and no roads are to be closed under this decision. Therefore, no immediate beneficial rehabilitation is anticipated or expected to occur off of designated routes. Over time, various exposed areas can be expected to establish some level of a vegetation component (not necessarily what existed at the site prior to the disturbance) and organic litter layers on exposed mineral soils or materials would exhibit fewer features of active erosion over time. The progression of vegetation establishment has been observed on the Forest (e.g., following fire events) and occurs at various rates based on variability in site characteristics. These include soil moisture conditions and retention capabilities, other continuing site disturbances, precipitation patterns, and seed source availability. In addition, the amount of surface soil components remaining at a disturbed site contribute to the length of time it can take areas to establish vegetation and organic litter. Sites with no remaining surface soil layers, or where OHV tracks are compacted, may no longer have site characteristics to support vegetation establishment and vegetative litter accumulation to a level (generally 50 to 70 percent) that would successfully prevent erosion without active rehabilitation efforts. Rehabilitation efforts at disturbed locations may occur through the implementation of future Forest project planning efforts.

An assumption from Chapter 2 is that the public is generally expected to observe and fully comply with the requirements of the designated transportation system with no unauthorized access following this travel management decision. As with effects to other resources, the extent and degree of effects to the soil resources would be expected to depend to a certain extent on the timeliness and effectiveness of maintenance as well as timeliness and effectiveness of future closures if designated routes or trailheads could not be maintained to standard (see Chapter 2). The assumption is that if transportation facilities are maintained to standard, they would meet Forest Plan standards and guidelines and Regional Watershed Conservation Practices. Therefore, while the potential for effects associated with motorized dispersed camping and game retrieval are expected to be minimal, the implementation of Alternative D could contribute the greatest benefit to soil resource conditions by having the least area available to cross-country travel (no motorized game retrieval and no dispersed camping) and the least total miles of designated motorized routes.

Hydrology

Introduction

This section describes and analyzes effects to the water resource in relation to motorized travel on the Black Hills National Forest. One of the key issues identified with this proposal is that the number of miles and location of routes proposed for motorized use could affect natural and cultural resources. Specifically, motorized activity could alter aquatic habitat conditions through soil erosion and sedimentation and changed hydrology patterns.

Research has shown and personal knowledge confirms that roads are a major source of sediment delivered to streams in watersheds. Research has not established consistent numerical criteria for determining when roads are likely to contribute sediment to streams that causes adverse affects. Direct, quantitative, cause-and-effect links between roads and the condition of aquatic habitat and species have been difficult to document (Gucinski et al. 2001).

From the standpoint of aquatics, it is desirable to have as little impact to the water resource as possible. Stream crossings would allow for passage of flow and sediment, withstand flood flows, allow free movement of aquatic life, and maintain current stream dimensions. Sediment would not be introduced to the streams from the roads and trails, floodplains and flood flows would not be changed or impacted, and riparian and wetland areas would not be impacted.

The area of analysis for the water resource includes all of the water resources contained within the Black Hills National Forest.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Three major laws and regulations apply to the water resource.

Clean Water Act

The Clean Water Act is the primary federal law in the United States governing water pollution. The principal body of law currently in effect is based on the Federal Water Pollution Control Amendments of 1972, which significantly expanded and strengthened earlier legislation. Major amendments were enacted in the Clean Water Act of 1977 and the Water Quality Act of 1987. Commonly abbreviated as the CWA, the Act established the symbolic goals of eliminating releases of high amounts of toxic substances to water, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and

recreation by 1983. The Act regulates discharges of pollutants from point sources through a permitting system. Nonpoint source pollution is controlled through the use of best management practices (BMPs) per State nonpoint source management plans.

Executive Order 11988 – Floodplain Management

Executive Order 11988 requires Federal agencies to avoid to the extent possible long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions: (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA 2008a).

Executive Order 11990 – Protection of Wetlands

The purpose of Executive Order 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". To meet these objectives, the Order requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The Order applies to: (1) acquisition, management, and disposition of Federal lands and facilities construction and improvement projects which are undertaken, financed or assisted by Federal agencies and (2) Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA 2008b).

Forest Plan Direction

Presented here are the Forest Plan standards that directly apply to travel management relating to the water resource. Listed below some of the Forest Plan standards are design criteria that are in the Watershed Conservation Practices Handbook (USDA Forest Service 2006c). Some of the Forest Plan standards are Watershed Conservation Practices.

Forest Plan Standard 1203 – Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.

a. Install stream crossings to meet Corps of Engineers and State permits, pass normal flows, and be armored to withstand design flows.

b. Size culverts and bridges to pass debris. Engineers work with hydrologists and aquatic biologists on site design.

c. Install stream crossings on straight and resilient stream reaches, as perpendicular to flow as practicable, and to provide passage of fish and other aquatic life.

d. Install stream crossings to sustain bankfull dimensions of width, depth, and slope and keep streambeds and banks resilient. Favor bridges, bottomless arches or buried pipe-arches for those streams with identifiable flood plains and elevated road prisms, instead of pipe

culverts. Favor armored fords for those streams where vehicle traffic is either seasonal or temporary, or the ford design maintains the channel pattern, profile and dimension.

Forest Plan Standard 1212 – Apply runoff controls to disconnect new pollutant sources from surface and ground water.

Forest Plan Standard 1301 – In the water influence zone (WIZ) next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.

Forest Plan Standard 1302 – Maintain long-term ground cover, soils structure, water budgets, and flow patterns in wetlands to sustain their ecological function, per 404 regulation.

a. Keep ground vehicles out of wetlands unless protected by at least 1 foot of packed snow or 2 inches of frozen soil. Do not disrupt water supply or drainage patterns into wetlands.

b. Keep roads and trails out of wetlands unless there is no other practicable alternative. If roads or trails must enter wetlands, use bridges or raised prisms with diffuse drainage to sustain flow patterns. Set crossing bottoms at natural levels of channel beds and wet meadow surfaces. Avoid actions that may dewater or reduce water budgets in wetlands.

e. Avoid any loss of rare wetlands such as fens and springs.

Forest Plan Standard 1304 – As opportunities arise, and need dictates, relocate or implement mitigation measures for roads, trails, water tanks, ponds, water catchments, and similar facilities currently located in the WIZ.

Methodology

Indicators

The following indicators will be used to measure the effects to the water resource across the range of alternatives:

- the number of road/trail crossings on perennial streams,
- miles of road/trail within 30 feet of a perennial stream (floodplain), and
- miles of road/trail within 119 feet of a perennial stream (WIZ).

Assumptions

The analysis presented here is based on the following assumptions:

- citizen routes are currently established on the ground
- unclassified routes are currently established on the ground
- proposed district routes are not established on the ground
- design criteria would be implemented and adequate funding would be provided for implementation, monitoring and enforcement

Design Criteria

Design criteria developed to conserve and protect the hydrologic resource is located in Appendix B.

Field Surveys and Other Analysis Information

The analysis is largely based on three sources of information:

- Attributes contained in GIS concerning the relationships between water resources and roads
- Field surveys containing information of condition of the water resources and roads over the years
- Personal knowledge of the water resources and roads by resource specialists

Affected Environment

The affected environment for the water resource is described in detail in the Forest Plan EIS and will not be repeated here. What will be discussed here are the components that have the potential to be affected by travel management and relate to the major laws and regulations listed above. The agency has provided guidance for NEPA analysis and different components that should be considered in the analysis. The areas that will be discussed are aquatic ecosystems relating to sediment, bed and bank stability, and temperature, wetlands, and floodplains.

Aquatic Ecosystems

Aquatic ecosystems are water dependent and the main areas of concern of streams. Streams are classified perennial, intermittent, or ephemeral and are defined in the Watershed Conservation Practices Handbook (USDA Forest Service 2006c; see text box).

Perennial stream - A stream or reach of a channel that flows continuously or nearly so throughout the year and whose upper surface is generally lower than the top of the zone of saturation in the areas adjacent to the stream

Intermittent stream - A stream or reach of stream channel that flows, in its natural condition, only during certain times of the year or in several years. Characterized by interspersed, permanent surface water areas containing aquatic flora and fauna adapted to the relatively harsh environmental conditions found in these types of environments

Ephemeral stream - A stream that flows only in direct response to precipitation in the immediate locality (watershed or catchment basin), and whose channel is at all times above the zone of saturation.

There are almost 3,500 miles of drainages on the Black Hills National Forest. It is not clear how many are intermittent and ephemeral drainages. There is an estimated 950 miles of perennial streams within the boundaries of the National Forest with an estimated 515 miles on National Forest System lands. Sediment, bed and bank stability, and temperature are the physical components of concern.

Sediment

Most sediment delivered to streams comes from a source zone along streams whose width depends on topography, soils, and ground cover. Connected disturbed areas like roads and other disturbed soils near streams can deliver sediment during runoff events. Sediment deposits in streambeds harm insect populations and fish reproduction. Road and stream crossings on the Black Hills National Forest are a big concern. There are an estimated 1,778 road/perennial stream crossings on the current road system (including unclassified roads and citizen routes), an estimated 59 miles of road within 30 feet of a perennial stream, and an estimated 285 miles of road within 119 feet of a perennial stream. Most of the sediment is generated when the road is closest to the stream and is best reflected with the miles within 30 feet. No streams in the Black

Hills National Forest are listed as impaired due to pollutants such as sediment derived from roads (SD DENR 2008).

Bed and Bank Stability

Bed and bank stability can be damaged from trampling by animals or humans, vehicle impacts, degraded bank vegetation, or excessive flow augmentations. Streams can be made wider and shallower, pools and overhanging banks can be destroyed, and much sediment can be added to streams. Vehicle impacts are of concern where off-road travel is permitted and streams are crossed by vehicles breaking down the streambanks. There are an estimated 1,000 crossings on user-created routes.

Temperature

Summer water temperature is increased, and winter water temperature is decreased, by removing shade, reducing low flows, or damaging banks so streams are wider and shallower. Dissolved oxygen is usually reduced when summer water temperature is increased. Such impacts impair or destroy the suitability of water bodies for aquatic biota. This is affected by road crossings that remove riparian vegetation, unmitigated low-water crossings, and from off-road vehicles crossing streams. Vehicles crossing streams tend to remove riparian vegetation and widen the streams, increasing water surface area. Removing riparian vegetation and increasing the water surface area increases the solar radiation input in the summer, which increases water temperature. It is unknown how many low-water crossings are on the current transportation system of an estimated 750 crossings and user-created routes of an estimated 1,000 crossings.

There are several streams listed within the Black Hills National Forest as impaired and not supporting designated beneficial uses due to temperature (SD DENR 2008). They are Battle Creek, Bear Butte Creek, Elk Creek, Grizzly Bear Gulch, North Fork Rapid Creek, Rapid Creek, Spring Creek, and Victoria Creek. All are streams listed as impaired due to natural sources. West Strawberry Creek is also listed as impaired due to temperature, but a cause is not listed. French Creek is listed as impaired due to dissolved oxygen from natural and drought-related sources. Dissolved oxygen and temperature are directly related.

Wetlands

Wetlands control runoff and water quality, recharge ground water and provide special habitats. Actions that may alter their ground cover, soil structure, water budgets, drainage patterns and long-term plant composition can impair these values. The USDI Fish and Wildlife Service completed mapping of wetlands for the National Wetland inventory that includes the Black Hills National Forest. This was completed through aerial photo mapping. It is a starting point for identifying wetlands. No determination can be made as to whether they are jurisdictional wetlands without a site visit to confirm that the three components of a wetland (hydrology, soils and vegetation) are in place. Generally, if any component is missing, it is not a jurisdictional wetland unless the area has been disturbed, and in that case, all three components are not required.

A large portion of the mapped wetlands is along ephemeral drainages. From personal observations, the hydrology and vegetation are not present to support a jurisdictional wetland along these drainages. The water regime modifier in many cases is seasonally flooded. With this information and looking at the modifiers, a query of the National Wetlands Inventory (NWI) layer was performed using modifiers that suggest more permanent water, such as saturated, semi-permanently flooded, and permanently flooded. A list of possible modifiers can be found in

Appendix A to the water resource specialist's report in the project file. This resulted in 120 miles of linear wetlands and 1,800 acres of polygon wetlands.

Wetlands are broken down into different categories. On the Black Hills National Forest, there are three categories:

- **Lacustrine** - Relating to lakes and a system of inland wetlands and deep-water habitats associated with freshwater lakes and reservoirs, characterized by the absence of trees, shrubs, or emergent vegetation;
- **Palustrine** - Relating to a system of inland, nontidal wetlands characterized by the presence of trees, shrubs, and emergent vegetation (vegetation that is rooted below water but grows above the surface). Palustrine wetlands range from permanently saturated or flooded land (as in marshes, swamps, and lake shores) to land that is wet only seasonally (as in vernal pools); and,
- **Riverine** - Relating to, formed by, or resembling a river and to a system of inland wetlands and deep-water habitats associated with nontidal flowing water, characterized by the absence of trees, shrubs, or emergent vegetation.

The linear wetlands consist of 1 percent palustrine and 99 percent riverine. The polygon wetlands are 91 percent lacustrine, 9 percent palustrine, and less than 1 percent riverine. Ninety-six percent (96%) of the lacustrine wetlands are the surface waters of Deerfield Lake, Pactola Reservoir, and Sheridan Lake.

Floodplains

Floodplains are natural escape areas for floods that temper flood stages and velocities. Floodplains occur on every stream. Floodplains store water, serve as natural sponges to moderate the release of high waters and act as filters to trap sediment and pollutants (Greater Yellowstone Coalition 2006). They are important because the loss of the function of floodplains can change the timing and peak of floods.

Mapped floodplains for the entire Black Hills National Forest do not exist. FEMA has completed maps of counties that participate in the National Flood Insurance Program. This includes all counties within the Black Hills National Forest within South Dakota. There are 11,000 acres of mapped 100-year floodplain on National Forest in South Dakota. No information or data could be located for Wyoming.

The Forestwide Travel Analysis Process Report (USDA Forest Service 2007a) used a buffer of 30 feet on perennial streams to address the encroachment into floodplains. The number of road crossings and miles of road within 30 feet would be a good indicator of possible impacts to the floodplain.

The current transportation system and user-created routes on the Black Hills National Forest currently have an estimated 750 perennial stream crossings and 59 miles of road within 30 feet of a perennial stream.

Environmental Effects Analysis

The effects analysis encompasses the effects resulting from the use, construction, and maintenance of designated motorized road and trial systems.

Effects Common to All Alternatives

Sediment

Ouren et al. (2007) state "Where OHV activity occurs, networks of OHV routes proliferate. Wheel cuts and tracks within these networks may serve as water conduits that channel and direct water flow containing sediments and contaminants into aquatic ecosystems".

There are several ways routes provide direct paths for accelerated runoff transporting sediments and road-associated contaminants to natural drainage channels. They include "(1) inboard ditches delivering runoff to a stream at a road-stream crossing, (2) inboard ditches delivering water to a cross-drain, (3) where sufficient discharge is available to create a gully or sediment plume that extends to the stream channel, (4) roads sufficiently close to streams so that the fill slope encroaches on the stream and (5) landslide scars on the road fill" (Ouren et al. 2007).

Figure 10. Example of sediment being added to a stream from a user-created route in a cross-country-use area

Sediments can be minimized from roads and trails. Research shows that where cross drains were positioned at sufficient distances from streams, the drainage discharge infiltrated the soil and did not contribute to sedimentation in streams (Ouren et al. 2007). The Forestwide Travel Analysis Report states "The major potential effect of roads on streams and lakes is related to sedimentation. Serious sedimentation in some streams would effect some fish and bird populations" (USDA Forest Service 2007a). See Figure 10.

The indicators for sediment are 1) the number of road and trail stream crossings, 2) miles of road and trail within 30 feet from a stream, and 3) miles of road and trail within 119 feet of a stream (to lesser extent). The closer the road and trail are to the stream, the greater the chance to introduce sediment to the stream.

Bed and Bank Stability

Bed and bank stability along a stream is affected when crossings are not designated or designed. This is related to traveling cross-country and pioneering new crossings or crossings that are not hardened. When a crossing is not hardened, it can become impassable and then users move to a new site, disturbing and destabilizing new banks (see Figure 11.

Temperature

Temperature of the streams can be affected when crossings are not designated or designed. Crossings not designated are related to traveling cross-country and pioneering new crossings, which tend to widen the streams at the crossings. Crossings not designed are generally low water crossings on roads that have evolved over the years (see Figure 12). Widening of the stream provides more water surface area to be exposed to solar radiation, thus having the potential of increasing water temperature. One widened stream crossing may not be a concern, but several can effectively raise the temperature of a stream.

Figure 11. Example of streambank instability from a user-created route in a cross-country-use area

Figure 12. Examples of stream widening and potential effect to water temperature from user-created routes when crossings are not hardened or properly mitigated

Wetlands

Roads can affect wetlands in several ways. Roads can alter surface water runoff patterns and contribute sediment or other contaminants. Road construction can fragment or remove wetland habitat. Roads can contribute to the spread of invasive species (including noxious weeds) resulting in greater competition with native species for resources. Finally, roads increase access for people and livestock, which can lead to trampling, cropping, and collecting of riparian plant species. Road systems are more likely to affect wetlands in valley bottom locations where

Figure 13.Example of wetland crossing from a user created route in a cross-country use area

wetland sites and road locations are more likely to coincide, than on drier, upland sites (USDA Forest Service 2007a). Road and trails that are not designed and are impacting wetlands are related to cross-country travel. They can disrupt flow patterns, contribute sediment, and remove vegetation, as well (Figure 13).

Roads and trails can be designed to avoid wetlands and wet areas or minimize the effects to wetlands, which would result in minimal impacts to wetlands. The design criteria related to wetlands (see Appendix B) would help protect and minimize the impacts from designed roads and trails.

Floodplains

The travel analysis report (USDA Forest Service 2007a) discusses how floodplains function in the hydrologic environment and how roads can affect them:

> "Roads can directly affect physical channel dynamics where they encroach on floodplains or restrict channel migration. Floodplains help dissipate excess energy during high flows and recharge soil moisture and groundwater. The functions of a floodplain are compromised when roads encroach on or isolate floodplains. This can increase discharge velocities during peak flows and result in increased bed and/or bank erosion and overall channel in stability. Roads that reduce the storage capacity of floodplains can also affect flood magnitudes downstream of the affected area. Restricting channel migration can cause channel straightening which increases the stream energy available for channel erosion. This can also result in channel instability. Altering channel pattern affects a stream's ability to transport materials, including wood and sediment".

Roads can impact floodplains and affect flood flows in the watershed. Road and stream crossings can impact a floodplain when the floodplain is filled to accommodate the crossing (see Figure 14). This fill can create an effective dike or dam and allow water to pass only through the opening of the bridge or culvert. This would usually back up the floodwaters and can raise the flood elevation. This also causes increased velocity at the constriction and can cause scour of

Figure 14. Example of filling across a floodplain creating an effective dike or dam that affects flood flows

the stream channel and possible channel incision. The number of road/stream crossings on perennial streams is a good indicator of the effects on floodplains. Currently there are 1,778 road crossings on perennial streams.

Constructed roads in close proximity to the creek can also affect floodplains. Road fill would occupy floodplains and reduce the area flood are allowed to spread out. With less floodplain area, the elevation of the flood would be raised. Miles of roads and trails within 30 feet of a perennial stream is another good indicator. Currently there are 59 miles of road within 30 feet of a perennial stream.

Comparison of Effects for all Alternatives

Table 29 displays the water resource indicators by alternative. It is presented here to give a display of all alternatives in one central location. Discussion of the effects will take place under each alternative discussion.

Table 29. Water resource indicators by alternative. These indicators are also applicable to the fisheries resource.

Indicator	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Number of road/trail crossings on perennial streams Forestwide	1,778	547	536	455	547
Miles of road/trail within 30 feet of perennial streams Forestwide	59	20	20	16	17
Miles of road/trail within 119 feet of perennial streams Forestwide	285	125	125	100	110

Alternative A – Direct and Indirect Effects

Sediment

This alternative would have the most impacts to the water resource from sediment because of the sheer number of unmitigated crossings and miles of road in proximity to streams, as illustrated in Table 29. Also, new user-created routes can be added under this alternative, because the Forest would be open to cross-country travel. No other alternative would have this kind of impact with the potential to add sediment to the streams and aquatic ecosystems. Some of the crossing can have disastrous effects as illustrated in Figure 10.

Bed and Bank Stability

This alternative would have the greatest effects on bed and bank stability because off-road travel and pioneering new trails with stream crossings would continue to occur. None of these new crossings and many of the existing crossings would not be mitigated to harden the crossings, thus contributing to increased bed and bank instability at the crossings. This is illustrated in Figure 11.

Temperature

This alternative would have the greatest effects on temperature because of the sheer number of unmitigated stream crossings. Also off- road travel and pioneering new trails with stream

crossings would continue to occur, widening the streams. Figure 12 illustrates widening of streams with unmitigated stream crossings.

Wetlands

This alternative has the largest area available to off-road travel and consequently the greatest potential impacts to wetlands. The greatest potential effects to wetlands are from creating new routes by traveling off roads and trails and big game retrieval or dispersed camping. Creating new trails and off-road travel through wet areas can have detrimental impacts as illustrated in Figure 13.

Floodplains

As indicated by the numbers in Table 29, this alternative would have the most potential impacts related to effects to floodplains just by the sheer number of crossings and miles in proximity to streams. No other alternative would have this kind of impact. All routes would remain and all fills would remain in the floodplains. New user-created trails generally would not introduce fill into the floodplain, and thus could be expected to have little effect.

Alternative B – Direct and Indirect Effects

Sediment

This alternative will have the second most impact to the aquatic ecosystems from sediment but is very similar to Alternatives C and E. There would be a 69 percent reduction in the number of stream crossing as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent and a 56 percent reduction in miles of road would be achieved within 119 feet of streams. All crossings would have the design criteria applied to them over time, thereby reducing impacts to the aquatic resource from sediment.

Game retrieval and dispersed camping under this alternative is not likely to have any adverse effects on the water resource and sediment. Guidelines 9107 and 9108, listed in the design criteria (Appendix B), would prevent or minimize impact to the water resource from sediment.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3 and design criteria ‘e, which directs the Forest to locate new concentrated-use sites outside the water influence zone (minimum 100 feet from waters edge) if practicable and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to avoid adverse indirect effects to the water resource from sediment.

Sediment being added to the streams under this alternative would be minimized when the design criteria are implemented to harden the crossings, provide drainage for roads and trails, and provide buffers for trailheads. Even with the design criteria in place, sediment would not be completely eliminated under this alternative.

Bed and Bank Stability

This alternative would not have an effect on bed and bank stability of the streams. All crossings would be designated and have design criteria applied that would harden all crossings so the bed and banks would be protected and remain stable. No other bank instability should occur.

Game retrieval and dispersed camping under this alternative is not likely to have any adverse effects on the water resource and bank and stream stability. Guidelines 9107 and 9108 listed in the design criteria (Appendix B) would prevent or minimize impacts to the water resource and to bed and bank stability.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource related to bed and bank stability. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3, and design criteria 'e', which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable) and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to protect the bed and bank of the streams.

Temperature

This alternative would have the second most impact to the aquatic ecosystems due to temperature but is very similar to Alternatives C and E. There would be a 69 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent. All crossings would have design criteria applied to them over time to maintain or reduce stream width, thereby reducing the impacts to the aquatic resource from potential temperature increases. Riparian vegetation that provides shade to the streams will always be permanently altered at crossings but maintaining proper stream width will help minimize impacts.

Game retrieval and dispersed camping under this alternative is not likely to have any adverse effects on the water resource and temperature. Guidelines 9107 and 9108, listed in the design criteria section (see Appendix B), would prevent or minimize impact to the water resource from temperature.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource related to stream temperature. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3, and design criteria 'e', which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable) and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to protect the temperature of the streams.

Wetlands

This alternative has the third largest area available to off-road travel and consequently the third most potential for impacts to wetlands. The potential impact would come from big game retrieval and dispersed camping if off-road travel occurs through wetlands or wet areas.

Floodplains

This alternative would have the second most impact to floodplains but is very similar to Alternatives C and E. There would be a 69 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent. The design criteria requiring crossing rehabilitation and reducing fill in floodplains (see Appendix B) would reduce impacts and restore the floodplains when implemented.

Alternative C - Direct/Indirect Effects

Sediment

This alternative would have the third most impact to the aquatic ecosystems from sediment but is very similar to Alternatives B and E. There will be a 70 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent and a 56 percent reduction in miles of road would be achieved within 119 feet of streams. All crossings would have design criteria (see Appendix B) applied to them over time, thereby reducing impacts to the aquatic resource from sediment.

Game retrieval and dispersed camping under this alternative is not likely to have any adverse effects on the water resource. Guidelines 9107 and 9108 (see Appendix B), would prevent or minimize impacts to the water resource from sediment.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3 and design criteria ‘e, which directs the Forest to locate new concentrated-use sites outside the water influence zone if practicable and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to avoid adverse indirect effects to the water resource from sediment.

Sediment being added to the streams under this alternative would be minimized when the design criteria are implemented to harden the crossings, provide drainage for roads and trails, and provide buffers for trailheads. Even with the design criteria in place, sediment would not be completely eliminated under this alternative.

Bed and Bank Stability

This alternative would not have an effect on bed and bank stability of the streams. All crossings would be designated and have design criteria applied that would harden all crossings so the bed and banks would be protected and remain stable. No other bank instability should occur.

Game retrieval and dispersed camping under this alternative is not likely to have any adverse effects on the water resource and bank and stream stability. Guidelines 9107 and 9108 listed in the design criteria (Appendix B) would prevent or minimize impacts to the water resource and to bed and bank stability.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource related to bed and bank stability. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3, and design criteria ‘e’, which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable) and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to protect the bed and bank of the streams.

Temperature

This alternative would have the third most impact to the aquatic ecosystems due to temperature but is very similar to Alternatives B and E. There would be a 70 percent reduction in the number of stream crossing as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent. All crossings would have design criteria applied to them over time to maintain or reduce stream width, thereby reducing the impacts to the aquatic resource from potential temperature increases. Riparian vegetation that provides shade to the streams will

always be permanently altered at crossings but maintaining proper stream width will help minimize impacts.

Game retrieval and dispersed camping under this alternative is not likely to have any adverse effects on the water resource and temperature. Guidelines 9107 and 9108, listed in the design criteria section (see Appendix B), would prevent or minimize impact to the water resource from temperature.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource related to stream temperature. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3, and design criteria 'e', which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable) and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to protect the temperature of the streams.

Wetlands

This alternative has the second largest area available to off-road travel and consequently the second most potential for impacts to wetlands. The potential impact would come from big game retrieval and dispersed camping if off-road travel occurs through wetlands or wet areas.

Floodplains

This alternative would have the third most impact to floodplains but is very similar to Alternatives B and E. There would be a 70 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent. The design criteria requiring crossing rehabilitation and reducing fill in floodplains (see Appendix B) would reduce impacts and restore the floodplains when implemented.

Alternative D – Direct and Indirect Effects

Sediment

This alternative will have the least impact to the aquatic ecosystems from sediment. There would be a 76 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 73 percent and a 65 percent reduction in miles of road would be achieved within 119 feet of streams. All crossings would have design criteria (see Appendix B) applied to them over time, thereby reducing impacts to the aquatic resource from sediment.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3 and design criteria 'e, which directs the Forest to locate new concentrated-use sites outside the water influence zone if practicable and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to avoid adverse indirect effects to the water resource from sediment.

Sediment being added to the streams under this alternative would be minimized when the design criteria are implemented to harden the crossings, provide drainage for roads and trails, and provide buffers for trailheads. Even with the design criteria in place, sediment would not be completely eliminated under this alternative.

Bed and Bank Stability

This alternative would not have an effect on bed and bank stability of the streams. All crossings would be designated and have design criteria applied that would harden all crossings so the bed and banks would be protected and remain stable. No other bank instability should occur.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource related to bed and bank stability. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3, and design criteria 'e', which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable) and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to protect the bed and bank of the streams.

Temperature

This alternative would have the least impact to the aquatic ecosystems due to temperature. There would be a 76 percent reduction in the number of stream crossing as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 73 percent. All crossings would have design criteria applied to them over time to maintain or reduce stream width, thereby reducing the impacts to the aquatic resource from potential temperature increases. Riparian vegetation that provides shade to the streams will always be permanently altered at crossings but maintaining proper stream width will help minimize impacts.

The designation of new trailheads in this alternative is not likely to have any adverse effects on the water resource related to stream temperature. All new trailheads meet Standard 1301, R2 Water conservation Practices Handbook Management Measure 3, and design criteria 'e', which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable) and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to protect the temperature of the streams.

Wetlands

This alternative, along with Alternative E, would have the least impact to wetlands. No off-road travel would be allowed with this alternative, which would result in no impacts to wetlands. Trail systems would generally avoid wetlands and wet areas.

Floodplains

This alternative would have the least impact to the floodplains. There will be a 76 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 73 percent. The design criteria requiring crossing rehabilitation and reducing fill in floodplains (see Appendix B) would reduce impacts and restore the floodplains when implemented.

Alternative E - Direct/Indirect Effects

Sediment

This alternative would have the fourth most impact to the aquatic ecosystems from sediment but is very similar to Alternatives B and C. There would be a 70 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 66 percent and a 56 percent reduction in miles of road would be achieved within 119 feet of streams. All crossings would have design criteria (see Appendix B) applied to them over time, thereby reducing impacts to the aquatic resource from sediment.

Sediment being added to the streams under this alternative would be minimized when the design criteria are implemented to harden the crossings, provide drainage for roads and trails, and provide buffers for trailheads. Even with the design criteria in place, sediment would not be completely eliminated under this alternative.

Bed and Bank Stability

This alternative would not have an effect on bed and bank stability of the streams. All crossings would be designated and have design criteria applied that would harden all crossings so the bed and banks would be protected and remain stable. No other bank instability should occur.

Temperature

This alternative would have the fourth most impact to the aquatic ecosystems due to temperature but is very similar to Alternatives B and C. There would be a 69 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 71 percent. All crossings would have design criteria applied to them over time to maintain or reduce stream width, thereby reducing the impacts to the aquatic resource from potential temperature increases. Riparian vegetation that provides shade to the streams will always be permanently altered at crossings but maintaining proper stream width will help minimize impacts.

Wetlands

This alternative, along with Alternative D, would have the least impact to wetlands. No off-road travel would be allowed with this alternative, which would result in no impacts to wetlands. Trail systems would generally avoid wetlands and wet areas.

Floodplains

This alternative would have the fourth most impact to the floodplains but is very similar to Alternatives B and C. There will be a 69 percent reduction in the number of stream crossings as indicated in Table 29. Miles of road within 30 feet of streams would be reduced by 71 percent. The design criteria requiring crossing rehabilitation and reducing fill in floodplains (see Appendix B) would reduce impacts and restore the floodplains when implemented.

Cumulative Effects

The cumulative effects area is bounded in space as the forest boundary and in time as the next 5 to 15 years. Activities considered in this cumulative effects analysis include road and trail use and management, mining, recreation, timber harvest, grazing, and reservoir use and management.

Sediment

Cumulative impacts to streams from sediment can come from roads, trails, mining, recreation, timber harvest, and grazing that occur near streams. Roads and trails would add sediment at crossings if not properly designed and mitigated. Mining would contribute point-source impacts adding sediment at specific locations. Mining areas are generally historic sites and any new mining activities would have BMPs implemented to minimize or eliminate sediment added to streams. Recreation impacts tend to be minimal, but some are associated with fishing as trails are developed along streams. Timber harvest can add sediment if equipment tracks across streams to get to units or if skidding occurs along or across streams. This is generally avoided or

minimized with the implementation of BMPs. Grazing impacts can add sediment along streams when cattle trample the banks as they access water.

There would be no cumulative impacts from travel management due to sediment with any of the action alternatives. This is because the number of stream crossings would be reduced and those crossings that remain would be mitigated with design criteria to reduce impacts from sediment. There would be cumulative impacts from the no action alternative, Alternative A, with the continued proliferation of trails with stream crossings and continued use of unmitigated stream crossings.

Bed and Bank Stability

Cumulative impacts to bed and bank stability can come from roads, trails, mining, recreation, timber harvest, and grazing that occur near streams. Roads and trails can have impacts at a crossing if it is not properly mitigated. When not properly mitigated, crossings can become impassable and new crossings may be developed, impacting more bank areas or causing wave action to erode unprotected banks. Mining will generally not impact banks unless it occurs in the stream itself. Recreation impacts tend to be associated with fishing as trails are developed along streams. Timber operations will generally avoid streambanks except at designated crossings that can impact bank stability at the crossing. This is generally avoided or minimized with the implementation of BMPs. Grazing impacts can impact bed and bank stability along streams when cattle trample the banks as they access water.

There would be no cumulative impacts from travel management to bed and bank stability with any of the action alternatives. This is because the number of stream crossings would be reduced and those crossings that remain would be mitigated with design criteria to reduce impacts from users finding new passable crossings. There would be cumulative impacts from the no action alternative, Alternative A, with the continued proliferation of trails with stream crossings and continued use of unmitigated stream crossings that may cause users to find a new crossing that they can navigate.

Temperature

Cumulative impacts to streams from temperature can come from roads, trails, mining, recreation, timber harvest, grazing, and reservoirs that occur on or near streams. Roads and trails can have impacts at a crossing if it not properly mitigated. When not properly mitigated, crossings can become very wide. Mining would generally not impact temperature unless the mining occurs close enough to the stream and removes streamside vegetation. Recreation can impact the water temperature of a stream when activities are heavy enough along streams to remove or reduce the streamside vegetation. Timber operations, with the implementation of BMPs, would avoid streams and generally not affect the vegetation shading along the stream. Grazing impacts occur along streams and could impact temperature through bank trampling and stream widening when cattle access the water and reduce the vegetation that shades the streams. Reservoirs on the stream provide more surface area that absorbs solar radiation. The absorption of solar radiation can increase surface water temperature of the reservoir and water that flows off the top of the reservoir would increase temperature downstream.

There would be no cumulative impacts from travel management from temperature with any of the action alternatives. This is because the number of stream crossings would be reduced and those crossings that remain would be mitigated with design criteria to reduce the width of the crossing to match the stream width. There would be cumulative impacts from the no action alternative, Alternative A, with the continued proliferation of trails with stream crossings

increasing stream width and continued use of unmitigated stream crossings that usually continually get wider.

Wetlands

Cumulative impacts to wetlands can come from roads, trails, mining, recreation, timber harvest, and grazing. Roads, trails and mining would contribute point source impacts affecting wetlands at specific locations and would be permanent. Recreation would impact wetlands along streams primarily where trails are developed. Timber can affect wetlands if equipment tracks through them to get to units, but they are generally prohibited from doing so. Grazing impacts can occur across the entire area because of the mobility of stock animals and if they are allowed to be in the area too long, impacts can occur from trampling and browsing of the vegetation.

There would be no additional cumulative impacts from travel management to wetlands with any of the action alternatives. This is because all of the trails generally already exist on the landscape, and any new trails would avoid wetlands. Any trails that are impacting wetlands would be mitigated or moved. There would be cumulative impacts from the no action alternative, Alternative A, with the continued proliferation of trails and direct impact to wetlands if the new trails go through wetlands.

Floodplains

Roads have the biggest potential impacts to floodplains. Other impacts can come from mining and private land development. All activities can fill and encroach on floodplains. All of these activities can have a cumulative effect and if enough impacts occur in a watershed, they could potentially change the character of floods downstream.

There would be no cumulative impacts from travel management to floodplains with any of the action alternatives. This is because all crossings of floodplains already existing on the landscape would be mitigated with design criteria to reduce or minimize the fill across floodplains. In addition, the number of floodplain crossings would be reduced and eliminated. The no action alternative, Alternative A, would not have a cumulative effect on floodplains even with the continued proliferation of trails because these new trails generally do not fill in the floodplain and will not restrict flood flows.

Monitoring and Recommendations

A stream-crossing inventory protocol needs to be completed for the transportation system that is adopted. The purpose is to find crossings not meeting current standards so a fix can be prescribed and implemented to reduce the impacts of the all crossings. It is recommended that this be completed by stream, starting with the streams that are listed as impaired due to temperature, and continuing on to the streams with the most crossings. It should be completed for the entire stream, catching crossings that were abandoned and are no longer used. A list of the streams in recommended order for completion of the protocol can be found in Appendix B to the water resource specialist’s report in the project file.

Conclusion

Implementing any alternative other than Alternative A would have great benefits on the water resource. The number of road and trail stream crossing would be drastically cut and new ones would not be pioneered in the future. Roads and trails in proximity to a stream would be reduced and new ones would not be pioneered. There would be an overall reduction of sediment

introduced into streams and low-water crossings would be improved and controlled to reduce the impacts due to water temperature.

The requirements of the Clean Water Act would be met by monitoring and completing the stream-crossing protocol. This would identify abandoned crossings that need rehabilitation and existing crossings that need to have the design criteria applied to the stream crossings on the road and trail system. When the design criteria are applied to the crossings, they would minimize and prevent sedimentation of the streams. It would narrowing existing crossings and prevent new crossings from widening the stream. This would meet the requirements of the Clean Water Act by keeping sedimentation and stream temperature in check at the crossings. Streams that are listed as impaired would be completed first.

The Executive Order for Floodplains would be complied with when the design criteria, to minimize fill in floodplains to facilitate crossings to allow flood flows to pass with minimal interruption, is implemented for new roads and trails and when old road and trails are obliterated and fill in the floodplains is removed.

The Executive Order for Wetlands would be complied with when the design criteria are implemented. They include (1) areas not connected to streams that are wet and have riparian and wetland vegetation would be avoided and runoff from the roads and trail would not be drained into these areas, and (2) avoid creating elevated roads and trails through wetlands which disrupt the flow of water through the wetland.

Forest Plan compliance would be achieved by meeting the requirements of the above laws and regulations and implementing the design criteria referenced here and outlined in Appendix B.

Fisheries

Introduction

This section describes and analyzes effects to the fisheries resource in relation to designation of a motorized road and trail system on the Black Hills National Forest. This analysis tiers to and incorporates by reference information in the Final Environmental Impact Statement (FEIS) prepared for the 1997 Revised Land and Resource Management Plan (Forest Plan; USDA Forest Service 1996a) and the FEIS and Biological Evaluation for the Forest Plan Phase II Amendment (USDA Forest Service 2005a). Additional information on watershed, riparian and aquatic resources can be found in the Wildlife, Plants and Botanical Resources, or Hydrology sections of this document and in the project record.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

The Region 2 Watershed Conservation Practices Handbook (Forest Service Handbook 2509.25) contains proven watershed conservation practices to protect soil, aquatic, and riparian systems. If used properly, the watershed conservation practices will meet applicable Federal and State laws and regulations, including State Best Management Practices (BMPs).

Executive Order 12962 – Recreational Fisheries, dated June 7, 1995, directs federal agencies to manage for increased recreational fishing opportunities by providing access for public participation and enjoyment of recreational fishery resources.

Executive Order 13474 – Amendments to Executive Order 12962, dated September 26, 2008, directs federal agencies to ensure that recreational fishing is managed as a sustainable activity.

Forest Plan direction specific to fisheries is identified below. Additional direction that indirectly benefits fisheries through aquatic and riparian habitat protection is identified in the Hydrology Specialist Report.

Goal 2. Provide for a variety of life through management of biologically diverse ecosystems.

- **Objective 217.** Maintain habitat for game and fish populations at the state objectives in effect in 1996.
- **Objective 219.** Maintain or improve instream fisheries habitat. Cooperate with state agencies in aquatic ecosystem improvements to meet mutually agreed-upon objectives.
- **Objective 221.** Conserve or enhance habitat for R2 sensitive species and species of local concern (SOLC). Monitoring will be conducted at a Forestwide level, not at the project level, and will be done for habitats or populations.
- **Objective 238d.** Maintain or enhance habitat quality and connectivity for mountain suckers, as outlined in specific direction pertaining to aquatic resources (e.g. Objectives 103, 104, 219, Standards 1201, 1203, 1205, Guideline 1115).

Goal 4. Provide for scenic quality, a range of recreational opportunities and protection of cultural resources in response to the needs of the Black Hills National Forest visitors and local communities.

The following Forest Plan standards and guidelines are pertinent to the fisheries resource. Some redundancy with the Region 2 Watershed Conservation Practices Handbook (Forest Service Handbook 2509.25) is noted.

- **Standard 1105.** Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate (Regional WCP Handbook Management Measure 9).
  - Design Criteria h. Designate, construct, and maintain recreational travelways for proper drainage and armor their stream crossings as needed to control sediment.
- **Standard 1201.** Conduct actions so that stream pattern, geometry, and habitats are maintained or improved toward robust stream health (Regional WCP Handbook Management Measure 5).
- **Standard 1203.** Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life (Regional WCP Handbook Management Measure 4).
  - **Design criteria a.** Install stream crossings to meet Corps of Engineers and State permits, pass normal flows, and be armored to withstand design flows.
  - **Design criteria c.** Install stream crossings on straight and resilient stream reaches, as perpendicular to flow as practicable, and to provide passage of fish and other aquatic life.
  - **Design criteria d.** Install stream crossings to sustain bankfull dimensions of width, depth, and slope and keep streambeds and banks resilient. Favor bridges, bottomless arches or buried pipe-arches for those streams with identifiable flood plains and elevated road prisms, instead of pipe culverts. Favor armored fords for those streams where vehicle traffic is either seasonal or temporary, or the ford design maintains the channel pattern, profile and dimension.

- **Guideline 1205.** When projects are implemented which can affect large, woody debris, retain natural and beneficial volumes of large, woody debris for fish habitat, stream energy dissipation, and as sources of organic matter for the stream ecosystem.
- **Standard 1301.** In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition (WCP Handbook Management Measure 3).
    - **Design criteria c.** Keep heavy equipment out of streams, swales, and lakes, except to cross at designated points, build crossings, or do restoration work, or if protected by at least 1 foot of packed snow or 2 inches of frozen soil. Keep heavy equipment out of streams during fish spawning, incubation, and emergence periods.
- **Guideline 3212.** Manage for high quality riparian communities; (a) Provide stable stream banks; (b) Retain woody vegetation along streams and lakes to provide shading for aquatic life and habitat for terrestrial species; (c) Provide large woody material for aquatic life.
- **Guideline 9109.** Walk-in fisheries are closed to motorized travel.

There is no additional management area direction specific to fisheries resources.

Methodology

The area of analysis includes perennial waterbodies (streams and lakes) that provide suitable fish habitat on the Forest. The following indicators were used to evaluate the effects on natural and cultural resources (Issue 1).

Indicators

The following indicators will be used to measure the effects to the fisheries resource:

- Number of motorized road and trail crossings on perennial streams. This indicator evaluates the relative risk that road and trail-stream crossings create in regard to stream fragmentation (barriers to fish passage) and habitat degradation (sediment input, loss of riparian vegetation, bank instability and increased stream channel width at crossings).
- Miles of motorized road and trail within 30 feet and 119 feet of perennial streams or lakes. Miles of road within 30 feet of a stream is a good initial indicator of where the road system might be affecting physical channel dynamics (USDA Forest Service 2007a). A buffer width of 119 feet was used as a long term, worst-case buffer width for capturing 97 percent of the sediment from a road in an area of highly erosive soils (USDA Forest Service 2007a).

Assumptions

This analysis assumes that all road and trail crossings of perennial streams have the same impact on stream connectivity and aquatic habitat quality. This assumption is justified due to the lack of a Forestwide inventory of stream crossings. It is also assumed that new stream crossings affect 10 feet of streambank.

Design Criteria

Design criteria developed to protect and conserve the fisheries resource can be found in Appendix B.

Field Surveys and Other Analysis Information

Site-specific field surveys were done on June 22, 2008, August 13, 25, 27 and 29, 2008 and September 18 and 19, 2008 to evaluate 121 perennial stream crossings identified as new nonsystem routes considered for designation on the motor vehicle use map. A random sample of closed roads that are proposed to be opened was also sampled on some of the above dates.

Perennial stream crossings were identified through a geographic information system (GIS) exercise that intersected the Forest stream layer with the travel management routes layer. Similarly, a GIS exercise was done to buffer the perennial streams layer and intersect this buffer with routes to determine the miles of routes in close proximity to water.

Affected Environment

The Forest Plan Phase II Amendment (USDA Forest Service 2006a) provides background information on fisheries. This information is incorporated by reference and summarized below. Additional information on watershed, riparian and aquatic resources can be found in the Wildlife, Plants and Botanical Resources or Hydrology sections of this document.

Historically, the diversity of fish species was limited in the Black Hills. Native species include suckers, chubs and dace. The finescale dace (*Phoxinus neogaeus*), lake chub (*Couesius plumbeous*) and mountain sucker (*Catostomus platyrhynchus*) are Region 2 sensitive fish species. These species are analyzed in detail in the biological evaluation (BE) for this project. The mountain sucker is also designated as a management indicator species (MIS). Of these three species, the mountain sucker is the most widely distributed on the Forest. There are no federally listed threatened or endangered fish species on the Forest.

Today, the majority of fish species on the Forest are non-native species introduced primarily to provide for recreational fishing opportunities. The primary game species include brook, brown, and rainbow trout. Other game species, such as bass, perch, pike and bullheads, are also present. Some species have been introduced illegally. Limited administrative access is currently needed to manage fisheries. The vast majority of waterbodies that are stocked, surveyed, or fished are motor vehicle accessible because other developed recreational facilities exist for camping, swimming, picnicking, or boating or access to the more heavily used recreational fishing streams occurs along paved or well-maintained roads.

Seven walk-in fisheries were designated in Travel Management Order 11, dated November 29, 1989 (USDA Forest Service 1989). Guideline 9109 closes walk-in fisheries to motorized travel, with the exception of administrative access.

Other undesirable aquatic species occur on the Forest. The diatom (single-celled algae) *Didymosphenia geminata* (didymo) was first documented in Rapid Creek downstream of Pactola Dam in 2002. This species forms dense mats of vegetation on the streambed. These mats affect habitat conditions and food production for fish. Didymo is able to survive and remain viable in cool, damp, dark conditions for at least 40 days (Spaulding and Elwell 2007).

Fish habitat on the Forest falls within two general categories: streams and creeks (flowing water or lotic habitat) and reservoirs, lakes, and ponds (standing water or lentic habitat). Approximately 950 miles of perennial streams exist within the Forest boundary. Slightly more than half of these miles flow through National Forest System lands; the remainder flows primarily through private lands. Aquatic habitat conditions are influenced by precipitation, geology, and other watershed characteristics. Stream connectivity is influenced by these natural

conditions as well as other manmade structures (dams) or barriers at road-stream crossings, such as impassable culverts.

There are no natural lakes in the Black Hills (Stewart and Thilenius 1964) but there are a number of manmade impoundments that provide fish habitat. These waterbodies range in size from 852 acres (Pactola Reservoir) to less than an acre (Strawberry Pond). Not all of these waterbodies are under the jurisdiction of the Forest Service. Many of these sites have additional recreational facilities for boating, camping, picnicking, or swimming and are accessible by motorized vehicles.

Environmental Effects Analysis

Alternative A - Direct and Indirect Effects

Direct effects (mortality or injury) to fish would only occur where motor vehicles drive through perennial streams or where in-water construction activities occur to install new structures (culverts, bridges, etc.) or to rehabilitate existing stream crossings. This impact relates primarily to fish eggs and fry that are immobile and more vulnerable to injury and more so to trout, which deposit their eggs in the stream substrate in concentrated areas (redds). Juvenile and adult fish are likely to swim away to avoid injury.

The magnitude of this impact is likely negligible. Habitat conditions at road and trail stream crossings are usually degraded. Therefore, these sites are less suitable for trout spawning, egg incubation, hatching, or the rearing of fry, so these life stages are less likely to be abundant at these sites. These crossing locations also make up a very small percentage of the available spawning habitat Forestwide. Direct effects to the most vulnerable life stages and fish species are further avoided and minimized through conservation measures for instream activities. These measures include Forest Plan Guideline 9107, which prohibits land vehicles from entering perennial streams where resource damage may occur except to cross at specified points. Also, the Regional Watershed Conservation Practices Handbook provides direction to keep heavy equipment out of streams, swales, and lakes (except to cross at designated points, build crossings, or do restoration work), and to keep heavy equipment out of streams during fish spawning, incubation, and emergence periods. Additional design criteria that define more specific seasonal in-water timing restrictions to protect fall-spawning brook and brown trout will also be implemented to further avoid direct effects.

Potential indirect effects to fisheries include a reduction in stream connectivity, the loss or modification of riparian and aquatic habitat, and the degradation of water quality due primarily to sediment input. Additional discussion of these effects to the physical and chemical aspects of water resources can be found in the Hydrology section.

Gucinski et al. (2001) provide a synthesis of scientific information on the effects of Forest roads. Roads may result in aquatic and riparian habitat loss due to floodplain encroachment or stream channel realignment. Unpaved road surfaces are a long-term source of sediment input. Roads may divert and concentrate surface flows, altering the normal runoff pattern transporting more sediment into streams, lakes, or wetlands. Poorly designed, installed, or maintained culverts may create barriers to fish passage, fragment aquatic habitat, and contribute sediment during their placement or removal or if fill material is washed-out due to debris blockage or overtopping of culverts during high-flow events.

Structures, particularly culverts, at road-stream crossings can block the movement of fish. Generally, this restriction is on upstream migration and is due to a change in water surface levels (a waterfall) at the culvert outlet, increased water velocities and/or inadequate water depth in the culvert. Fish passage needs are species-specific. For example, trout are generally stronger swimmers and better jumpers than suckers or minnows. A positive habitat effect often observed at perched culvert outfalls is the creation of a plunge pool. These deeper pools provide suitable fish habitat, especially in the fall and winter months when stream flows are at their lowest level.

The number of perennial stream crossings, and therefore the potential for adverse effects, are greatest under Alternative A. New barriers to fish passage are avoided under Alternative A through the implementation of Standard 1203, which requires that all stream crossings and instream structures be designed and constructed to allow free movement of aquatic organisms.

In aquatic ecosystems, adverse effects from roads are often associated with sediment delivery. Increased amounts of sediments may degrade high-quality spawning habitat or decrease the volume of pool habitats (Isaak et al. 2003). This may result in less successful spawning activity, a change in the macroinvertebrate populations, or a change in the aquatic plant community (Gucinski et al. 2001). Guidelines 9107 and 9108 reduce these adverse impacts. Guideline 9107 prohibits land vehicles from entering perennial streams where resource damage would occur except to cross at specified points. Guideline 9108 restricts vehicular traffic to roads and trails in riparian areas.

Alternative A has the greatest potential of all the alternatives to affect fisheries from motorized big game retrieval and motorized dispersed camping based on the acres where this activity is currently allowed. However, motorized big game retrieval in Alternative A is likely having a negligible effect on fisheries because this activity only occurs for a few months out of the year. The majority of motorized dispersed camping sites have already been established from historic use at the most favorable locations, so limited new adverse impacts to fisheries are anticipated. Alternative A should have negligible indirect effects to fisheries with the implementation of Guidelines 5301, 9107 and 9108. Guideline 5301 discourages dispersed camping within 100 feet of lakes and streams unless exceptions are justified by terrain.

Motor vehicle access to recreational fishing sites would be maintained under this alternative consistent with Executive Orders 12962 and 13474. Administrative access to conduct fisheries management activities on roads not open to the public is allowed per Guideline 9104.

Motor vehicle use has the potential to spread aquatic nuisance species through the direct transfer from one waterbody to another or by providing easier and quicker access than nonmotorized methods. The greatest threat of aquatic nuisance species introduction or spread likely occurs from people using developed recreation sites, such as Pactola or Sheridan reservoirs or at Spearfish, Castle, and Rapid Creeks, where there is more boat or vehicle traffic entering the water and this traffic arrives from the largest geographic area. Currently, off-highway vehicle use is likely having a negligible effect related to the incidental transfer of aquatic nuisance species from one waterbody to another.

Alternative A maintains species viability for the three sensitive fish species (finescale dace, lake chub, and mountain sucker) that occur on the Forest. Due to the direct and indirect effects described above, the determination for Alternative A for these three species is "**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, or cause a trend toward federal listing**".

The Forestwide population and habitat trend for the mountain sucker was assessed given its status as a management indicator species. The Forestwide population trend for mountain sucker is one of decline when comparing past to present occurrence (USDA Forest Service 2007b). Alternative A would maintain stream connectivity because no additional instream structures are proposed that would impede mountain sucker passage, consistent with Standard 1203. Implementation of Forest Plan standards and guidelines and Regional Watershed Conservation Practices are intended to maintain habitat quality through riparian and aquatic conservation. Subsequently, Alternative A meets the intent of Objective 238d to maintain or enhance mountain sucker habitat quality and connectivity.

Direct and Indirect Effects Common to all Action Alternatives

The action alternatives share the same direct and indirect effects that result from stream crossings and roads and trails that are in close proximity to waterbodies as described for Alternative A. These similarities are represented by the same indicators summarized in Table 29 of the Hydrology section (page 123); in general, the larger the number, the greater the potential for adverse effects to fisheries.

New barriers to fish passage are avoided under all action alternatives through the implementation of Standard 1203, which requires that all stream crossings and instream structures be designed and constructed to allow free movement of aquatic organisms. All of the nonsystem routes that are proposed to be designated on the motor vehicle use map have low-water crossings (fords) that are not barriers to fish passage. Existing stream crossings on routes that would not get designated on the motor vehicle use map may continue to fragment stream habitat if an instream structure, such as a perched culvert outfall, occurs at these crossings and blocks the passage of fish.

The potential effects on fisheries management and recreational fishing opportunities were evaluated. Guideline 9104 is common to all action alternatives and states that motorized vehicles may be used on restricted areas and roads to accomplish administrative purposes. Therefore, motorized vehicle access to streams and lakes to conduct fisheries surveys or to stock fish would be the same for all the action alternatives (B, C, D, or E) as compared to current management (Alternative A). Access to developed recreational sites and more heavily used recreational stream fisheries would continue to be open to motorized vehicle use under Alternatives B, C, D, or E. Subsequently, all of the action alternatives provide recreational fishing access similar to Alternative A and are consistent with Executive Orders 12962 and 13474.

The potential introduction or spread of aquatic nuisance species or other undesirable aquatic species was evaluated. Off-highway vehicle use is likely to have minimal adverse effects related to the incidental transfer of aquatic nuisance species from one waterbody to another. As previously stated, all Alternatives maintain the same level of motorized vehicle access to the primary recreational fishing sites on the Forest. Therefore, the risk of aquatic nuisance species introduction or spread is similar to Alternative A.

All action alternatives maintain the same level of motorized vehicle access to streams and lakes for fisheries management activities because administrative access (Guideline 9104) will continue to be provided on routes not open to the public. All action alternatives maintain the same level of access for recreational fishing opportunities consistent with Executive Orders 12692 and 13474 because the primary recreational fisheries are located in association with developed recreation sites, such as campgrounds or boat ramps, or they are accessed by roads that are proposed to remain open.

The designation of new trailheads in Alternatives B, C and D is not likely to have any adverse effects on fisheries. All new trailheads will be consistent with Standard 1301 and R2 Watershed Conservation Practices Handbook Management Measure 3, design criteria “e”, which directs the Forest to locate new concentrated-use sites outside the water influence zone (if practicable), and outside riparian areas and wetlands. Compliance with this direction would provide an adequate vegetative buffer to avoid adverse indirect effects to fish habitat.

The site-specific effects to the finescale dace, lake chub and mountain sucker are disclosed in the biological evaluation and summarized here. The effects determination for these three sensitive fish species for all action alternatives is “**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, or cause a trend toward federal listing**”. Impacts to individuals are primarily associated with indirect effects resulting from potential stream fragmentation due to instream barriers at motorized road or trail crossings on perennial streams and/or aquatic and riparian habitat loss or degradation. Additional stream fragmentation is avoided given the lack of new instream structures, such as culverts, that may be barriers to fish passage. All the action alternatives provide less risk to these three sensitive fish species than Alternative A; therefore, species viability would continue to be maintained.

All action alternatives would have a positive effect on the Forestwide mountain sucker population and/or habitat trend by maintaining or improving stream quality and connectivity. No additional instream structures are proposed that would impede mountain sucker passage, consistent with Standard 1203. Implementation of Forest Plan standards and guidelines and Regional Watershed Conservation Practices are intended to maintain habitat quality through riparian and aquatic conservation. Therefore, all action alternatives meet the intent of Objective 238d to maintain or enhance mountain sucker habitat quality and connectivity.

Alternative B – Direct and Indirect Effects

Compared to the existing condition, this alternative would reduce the number of stream crossings by 69 percent and the miles of routes within 30 feet and 119 feet of perennial streams by 66 percent and 56 percent, respectively. This would be a positive impact. Six new perennial stream crossings are proposed. A total of about 60 feet of stream channel would likely be modified at these crossings. Water quality standards would be maintained and seasonal in-water work restrictions would be employed during the construction of these new crossings to avoid adverse effects to fish.

Motorized big game retrieval in Alternative B would likely have a negligible effect on fisheries for the same reasons mentioned for Alternative A. The potential for effects to fisheries is further reduced because it is allowed on the least area Forestwide and is only for the retrieval of elk.

Alternative B would reduce the potential for adverse effects to fisheries from motorized dispersed camping when compared to the current condition because the distance (100 feet) from routes and the area available for this activity would be greatly reduced. In principle, Alternative B should have negligible effects with the implementation of Guideline 5301. This guideline discourages dispersed camping within 100 feet of lakes and streams unless exceptions are justified by terrain.

Alternative C – Direct and Indirect Effects

This alternative has effects very similar to Alternative B. It would reduce the number of stream crossings by 70 percent and the miles of routes within 30 feet and 119 feet of perennial streams by 66 percent and 56 percent, respectively. This would be a positive impact. Five new perennial

stream crossings are proposed. A total of about 50 feet of stream channel is likely to be modified at these crossings. Water quality standards would be maintained and seasonal in-water work restrictions would be employed during the construction of these new crossings to avoid adverse effects to fish.

Overall, motorized big game retrieval in Alternative C would likely have a negligible effect on fisheries for the same reasons mentioned for Alternative A. Motorized big game retrieval in Alternative C would have more potential to affect fisheries than Alternative B because it includes motorized retrieval of both deer and elk and it includes more area open to motorized retrieval.

Alternative C would reduce the potential for adverse effects to fisheries from motorized dispersed camping when compared to the current condition because the distance (300 feet) from routes and the area available for this activity is reduced. In principle, Alternative C should have negligible effects with the implementation of Guideline 5301. This guideline discourages dispersed camping within 100 feet of lakes and streams unless exceptions are justified by terrain.

Alternative C is not consistent with Guideline 9109 in relation to walk-in fisheries and motorized use. This alternative proposes designating a single-track trail (route CZ-4895) that crosses Rapid Creek below Pactola Dam within the Rapid Creek walk-in fishery. Designation of this route would result in some loss of the “walk-in” fishing experience due to the motorized vehicle noise that would occur. The magnitude of this impact is difficult to predict, but would depend on the level of use and the overlap in time between anglers and motorized recreationists.

This same route (CZ-4895) crosses Rapid Creek where didymo, an aquatic nuisance species, is present. If dirt bikes cross Rapid Creek, there is the potential to pick up and transfer didymo to another waterbody, though this risk is low. Installation of a bridge on the abandoned railroad grade prior to this route segment being designated on the motor vehicle use map would eliminate the potential risk of didymo transfer and would also reduce negative impacts to water quality and riparian vegetation.

Alternative D – Direct and Indirect Effects

Compared to the existing condition, this alternative would reduce the number of stream crossings by 74 percent and the miles of routes within 30 feet and 119 feet of perennial streams by 73 percent and 65 percent, respectively. This alternative would have the greatest positive benefit to fisheries. Two new perennial stream crossings are proposed. A total of about 20 feet of stream channel would likely be modified at these crossings. Water quality standards would be maintained and seasonal in-water work restrictions would be employed during the construction of these new crossings to avoid adverse effects to fish.

Both the motorized retrieval of big game and motorized dispersed camping are prohibited in this alternative. Therefore, no direct or indirect effects to fisheries are anticipated from those activities.

Alternative E – Direct and Indirect Effects

Compared to the existing condition, this alternative would reduce the number of stream crossings by 69 percent and the miles of routes within 30 feet and 119 feet of perennial streams by 71 percent and 61 percent, respectively. This would be a positive impact. Similar to Alternative D, both the motorized retrieval of big game and motorized dispersed camping are prohibited in this alternative. Therefore, no direct or indirect effects to fisheries are anticipated from those activities. No new stream crossings are proposed.

Cumulative Effects

Stream connectivity is affected by a number of factors. Both large and small dams occur Forestwide that fragment the stream system both on National Forest System lands and other land ownerships. These dams are likely to persist because they serve one or more purposes related to flood control, recreation, or water supply. Roads to private lands and other roads outside National Forest have impassable fish barriers at road-stream crossings that are likely to persist. The likelihood of additional instream barriers exists as development of private inholdings continues and additional motor vehicle access is needed.

Historic and ongoing mining, grazing, logging, water storage and diversion, and recreational and road-related activities have modified stream habitat conditions. Efforts to improve stream crossings and aquatic habitat conditions will continue through focused program efforts, such as the Wildlife, Fish, and Rare Plants Program, through timber sale area improvement activities and through special emphasis programs, such as the Legacy Roads and Trails Program. These activities are likely to continue at levels similar to the current condition. Administrative access on routes not designated on the motor vehicle use map will continue. This will result in the continued use of some stream crossings and routes in close proximity to streams that are otherwise closed to the public. This ongoing use will slow or impede the natural recovery of these sites dependant on the level of motorized traffic.

The introduction and spread of aquatic nuisance species can have dramatic negative effects on aquatic ecosystems. Activities, such as nonmotorized trail use, boating, fishing, water quality monitoring, fisheries surveys, or aquatic habitat restoration have the potential to introduce or spread aquatic nuisance species. Given the ever-expanding global spread of aquatic nuisance species, it is likely a matter of time before additional aquatic nuisance species occur on the Forest.

Cumulative Effects Analysis

The cumulative effects area for fisheries is bounded in space as the Forest boundary and in time as the next 5 to 15 years. This temporal scale is based on: (1) the time over which one can expect to predict reasonably foreseeable actions and (2) roughly the time until the next Forest Plan Revision. The Forest boundary was chosen because it encompasses similar ecosystem components and species that occur on the Forest. A larger area would include the surrounding plains, which includes a vastly different suite of species and ecosystem components.

All action alternatives would have a positive incremental impact on stream connectivity and aquatic habitat quality because they would reduce the number of stream crossings and the miles of routes within 30 and 119 feet of perennial streams. The number of perennial stream crossings, and therefore the potential for adverse effects, are greatest under Alternative A. Alternative D has the fewest crossings. Alternatives B, C and E have about the same number of crossings. Alternatives B, C and D would have 6, 5 and 2 new stream crossings, respectively, but stream connectivity and habitat quality would not be reduced with the implementation of standards and guidelines and regional watershed conservation practices. All other stream crossings already exist on system or non-system roads and trails.

The designation of existing user-created routes on the motor vehicle use map is not likely to have an additive incremental impact on stream connectivity because these routes are all low-water crossings that lack instream structures (culverts), thereby avoiding barriers to fish movement. Opening a closed road to motor vehicle use, changing the use from a road to a trail or closing a road is not likely to have an additive incremental impact on stream connectivity because these

routes were engineered when they were constructed and the structures or improvements are in place at stream crossings.

Alternative D would have the greatest positive incremental impact on habitat quality because it results in the lowest number of stream crossings and lowest mileage of motorized roads and trails in close proximity to streams. Alternatives B, C and E are fairly similar in their number of streams crossings and route mileage in close proximity to perennial streams. Alternative A would have the largest adverse affect based on the indicators. All action alternatives have the positive incremental impact that no additional user-created or unclassified routes would be created, though additional new routes may be added in the future. Those routes not designated on the motor vehicle use map would rehabilitate naturally over time (except where administrative access may continue to occur) or quicker if site-specific remedial action is taken sooner.

Routes with new perennial stream crossings would result in the additive incremental impact of 60, 50, and 20 feet of stream channel modification in Alternatives B, C, and D, respectively. This impact is minor in a Forestwide context, but could be reduced slightly if two new route segments/crossings (CZ-0631 and MY3) are not designated on the motor vehicle use map. These routes are redundant with other existing routes in the immediate vicinity. Non-designation of these two routes/crossings would reduce the incremental impact to 40 feet in Alternative B and 40 and 10 feet, respectively, in Alternatives C and D.

The designation of non-system roads and trails on the motor vehicle use map may result in additional use on these routes in the future. This would likely have a negative additive incremental impact resulting in additional stream channel widening, decreased bank stability, loss of riparian vegetation, and increased sediment input at low-water stream crossings due to the more frequent and higher volume of use. This will likely be most apparent on some single-track (dirt bike) routes that are currently hard to detect on the ground due to the limited use now. A design criterion to monitor and remediate these crossings has been identified to lessen this impact.

None of the action alternatives have an additive incremental impact on fisheries management activities requiring motor vehicle access because heavily used recreational fishing sites would still be accessible via motor vehicles and administrative access would be provided (Guideline 9104) when needed to access routes not open to the public. Subsequently, no cumulative effects would occur.

None of the action alternatives have an additive incremental impact on access to recreational fishing opportunities because the primary fisheries occur at developed recreation sites or along the larger perennial streams adjacent to level 3, 4, or 5 roads that remain open to public motor vehicle use. Alternative C is likely to have a negative cumulative effect on the Rapid Creek walk-in fishery experience because it proposes a new motorized route in this stream reach that would likely reduce the quality of the fishing experience for which this area was originally designated.

Generally, Alternatives B, D, and E are likely to have a similar or a slightly reduced level of additive incremental impact compared to Alternative A in regards to the potential introduction or spread of aquatic nuisance species. Alternative C with its one new proposed stream crossing in Rapid Creek within the current distribution of didymo, could potentially transfer didymo to other waterbodies, but this risk is probably less than the potential spread due to foot traffic that occurs in this reach by anglers and hikers. A bridge rather than a lower water crossing of Rapid Creek would eliminate this concern. All alternatives maintain the same level of motor vehicle access to

streams and lakes that have developed recreation sites. These sites are likely to get the highest recreational visitor use from the broadest geographic area and therefore have the highest risk of aquatic nuisance species introduction.

Wildlife

Introduction

This section discusses the analysis of effects of the proposed action and alternatives on management indicator species (MIS), threatened and endangered species, sensitive species, species of local concern (SOLC), demand species, and migratory birds. Each of these categories of species is defined in their respective sections.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Endangered Species Act (ESA). This document analyzes and determines the likely effects of the alternatives on federally listed threatened and endangered species. Section 7(a) (1) of the ESA requires federal agencies to use their authorities to further the conservation of listed species. Section 7(a) (2) requires that federal agencies ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of federally listed species, or destroy or adversely modify designated critical habitat.

National Forest Management Act (NFMA). Provide for a diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives of a land management plan.

FSM 2620.44 (4). Evaluate the cumulative effects of proposed management on habitat capability for wildlife, including endangered, threatened, and sensitive animal species.

FSM 2620.01 (Black Hills Supplement). Provides direction to consider species of local concern during project design and evaluate the effects to the species from alternatives considered through the NEPA process.

FSM 2670. Provides direction to evaluate the effects on threatened, endangered, and sensitive species as part of the biological evaluation and NEPA process.

Forest Plan Objectives, Standards, and Guidelines. The following Forest Plan objectives, standards, and guidelines provide direction for management of wildlife species and their habitat on the Black Hills National Forest. Due to the extensive number of objectives, standards and guidelines that are applicable to wildlife management, the details of each are not provided here. Please refer to the Wildlife specialist report or the Forest Plan for more information.

Objectives: 105, 110, 112, 113; 201, 202, 205, 239-LVD, 211, 213, 217, 218, 220, 221, 230, 231, 237, 238 (a-d); 309; 5.4-207, and 5.43-205.

Standards: 1113, 1301, 1302, 1401 (a, b), 2301 (a, b), 2305, 3101 (a-d), 3102, 3103 (a-e), 3108 (a, b), 3111, 3116, 3123, 3204, 3207, and 3215

Guidelines: 3202, 9107, and 9108

Methodology

A pre-field review was conducted of available information to assemble occurrence records and describe habitat needs and ecological requirements for each species. Sources of information included Forest Service records and files, NRIS FAUNA database, South Dakota Game, Fish, and Parks (SDGFP), Wyoming Game and Fish Department, and published research (citations). This information served as the basis for determining the effects of the alternatives on wildlife species. In addition, publications based on field work conducted by other parties in the Black Hills and elsewhere were also used as appropriate.

The analysis of effects on wildlife species was conducted using existing data and the habitat requirements for each species. The habitat requirements for each species were used to determine the effect of the alternatives on each wildlife species. The habitat impacts and risks to species on the Forest were estimated based on the best available science and data. The overall conclusions were derived from anticipated trends, probable risks, and degree of uncertainty under each alternative.

Determinations for each threatened, endangered, and sensitive species are made as a result of the existing information gathered during the pre-field review and evaluated in the effects analysis. The basis for each determination is potential habitat, expected occurrence, distribution, effects from proposed activities, and proposed design features used to alleviate the potential effects resulting from management activities.

The analysis of effects for wildlife is based primarily on the direct impacts on wildlife (collisions, etc.) and the indirect impacts of disturbance to wildlife. The analysis of effects includes only a limited discussion of habitat alteration because the amount of habitat lost to different types of roads is subjective and not standardized. Many of the roads and trails identified in the alternatives are either part of the current Forest transportation system or have been used unofficially and exist on the ground. The amount of habitat gained or lost by closing or opening roads, trails or areas would be minimal and immeasurable at a Forest scale. The primary impact of the project on wildlife is expected to be disturbance, not habitat alteration.

The effects of disturbance to wildlife are based on the miles of motorized routes in a species habitat and the acres of habitat open to motorized cross-country travel. Geographic information systems data were used to query the miles of motorized routes and acres open to motorized cross-country travel in different habitat types used by each species.

The indirect and cumulative effects analysis is bounded in time as the next 5 to 15 years. This temporal scale is based on: (1) the time over which one can expect to predict reasonably foreseeable actions and (2) roughly the time until the next Forest Plan Revision.

For wildlife species, the spatial scale for cumulative effects analysis generally encompasses the area within the Forest boundary. This area was chosen because it encompasses similar ecosystem components and species that occur on the Forest. A larger area would include the surrounding plains, which includes a vastly different suite of species and ecosystem components.

Indicators

The wildlife effects analysis uses the following as indicators of effects for each alternative.

- Miles of motorized routes forestwide
- Acres open to motorized cross-country use

- Acres open to motorized game retrieval
- Acres open to motorized dispersed camping
- Miles of routes in general wildlife habitat components
  - Miles of motorized routes in ponderosa pine habitat
  - Miles of motorized routes in spruce habitat
  - Miles of motorized routes in hardwood habitat
  - Miles of routes within 400 feet of riparian areas
  - Miles of motorized routes in grass cover-types
  - Miles of routes in mountain mahogany (shrubland) habitat
- Miles of routes in species-specific habitat or use areas.
- Routes identified with a relative risk to dippers in the Forestwide Travel Analysis Report (September 2007).
- Winter open route density in Management Areas 5.4 and 5.43.

Assumptions

- There would be little new construction needed on newly added routes. There may be minor repairs needed at water crossings or other points, but the majority of the routes are adequate for use in their current condition.
- The amount of direct wildlife mortality as a result of vehicle collisions is correlated with the miles of motorized routes in wildlife habitat and the acres of habitat open to motorized cross-country travel. This makes sense generally at the Forest scale. Different types of roads likely pose different levels of risk, but most of the roads being considered in the alternatives for closure or addition to the system are of similar maintenance level (lower maintenance level, with slower speeds).
- Disturbance impacts to a species from motorized users are correlated with the miles of road within the species' habitat and the acres of habitat open to motorized cross-country travel.
- All motorized routes are equally disturbing to wildlife or a specific species. In reality, all routes are probably not equally disturbing. However, the different types of routes and the difference in effects from those routes can't be teased out at the Forestwide scale. Since one is unable to determine where and when these different disturbances would occur and whether an animal would be nearby, it is assumed for analysis purposes that all motorized routes are about equal relative to wildlife disturbance.

Design Criteria

Design criteria developed to protect and conserve wildlife species and their habitats can be found in Appendix B.

Field Surveys

No wildlife surveys were done specifically for this project. For most wildlife species, information on presence or relative abundance of the species would not improve project design to reduce adverse effects, or allow better assessment of effects. Information on the presence of northern goshawk nests and snail colonies (*Oreohelix* sp.) may improve project design to reduce adverse effects, but it was not feasible to complete surveys. It could take several years to complete surveys using a method that would determine presence of most goshawk nests and snail colonies. Therefore, existing data was used. Field reconnaissance has continued to be

gathered during work on other projects and Forestwide monitoring efforts. The information gathered from these surveys and stored in the NRIS FAUNA database provided information on distribution and habitat associations for species and helped to determine effects of the alternatives.

Routes and trailheads were visited if the pre-field review showed a potential conflict with Forest Plan standards. In most cases, the routes or trailheads were consistent with Forest Plan standards. Routes and trailheads with field verified conflicts with Forest Plan standards were modified according to design criteria to be consistent with Forest Plan standards.

Affected Environment

General Wildlife and Habitat Components

Roads affect wildlife species through direct mortality, modification of behavior, habitat alteration, spread of exotics, and disturbance through increased human use (Trombulak and Frissell 2000). Direct mortality can occur from vehicle collisions or by being run over by vehicles (Trombulak and Frissell 2000). Collisions are less likely to occur on primitive roads and trails where traffic is slower than on more well-developed roads and highways (Oxley et al. 1973). Some collisions likely occur on all route types, but there no data available documenting the current number of collisions on the Forest. In general, the more motorized routes and motorized use in wildlife habitat, the more potential there is for wildlife and vehicle collisions. Cross-country travel (off roads and trails) can also cause direct mortality. The loss of habitat to road or trail construction is unknown, but is often estimated at 5 acres per linear mile (Rowland at al. 2004). Different types of roads and trails result in different levels of habitat loss. A single-track route that winds among the trees obviously results in less habitat loss than a forest road. Cross-country motorized travel can also reduce habitat through repeated use by killing the vegetation.

Roads can also promote habitat fragmentation for some species. Roads can fragment habitat into smaller patches and increase the ratio of edge to forest interior areas. More road miles mean a reduction in the amount of available interior habitat for requisite interior species, such as marten and brown creepers (Reed et al. 1996).

Disturbance from motorized recreation may cause animals to abandon favored habitat or expend more energy. Noise might affect predator avoidance, food intake, social interactions, reproductive activities, or parenting (Bowles 1995). Animals can habituate to noise, but the process is slow (Bowles 1995). Animals are more likely to habituate to noises that occur on a regular basis; for example, constant traffic on a well-used road. If animals respond as soon as they hear a noise, vehicles would affect them at greater ranges than humans. However, if the animals are habituated to vehicle noise, humans laughing and yelling can cause responses at greater ranges (Bowles 1995). Off-highway vehicles may represent a combination of irregular traffic patterns that prevent habituation and more frequent stops with resulting human activities (laughing and talking).

Non-native invasive plants can adversely affect native plant communities by aggressively competing for nutrients, water, and sunlight. As a result, sensitive plants, forage quantity and quality, and soil stability can be negatively impacted.

Ponderosa Pine Habitat

Ponderosa pine is the dominant tree species on the Forest and occurs from low to high elevations on all soil types and aspects (USDA Forest Service 2005a). As a result, ponderosa pine serves as a habitat component for most wildlife species on the Forest. The ponderosa pine cover type is broken into nine structural stages based on tree size and canopy closure because some species use certain structural features on ponderosa pine. There are about 1,037,000 acres of ponderosa pine on the Forest (USDA Forest Service 2007b). Much of the ponderosa pine habitat is currently open to motorized cross-country travel. Existing motorized route information in ponderosa pine habitat is shown below.

Table 30. Existing motorized recreation information for ponderosa pine habitat

Structural Stage	Miles of Motorized Routes
1	333
2	104
3A	125
3B	145
3C	55
4A	969
4B	698
4C	226
5	6
Total	2,661

White Spruce Habitat

The Black Hills has one of the southern-most populations of white spruce in the United States. White spruce is the most shade tolerant of the Black Hills tree species, enabling regeneration and growth under closed canopy conditions. The cool, moist environments of white spruce stands provide habitat diversity in a ponderosa pine-dominated landscape. Spruce provides habitat for many species including golden-crowned kinglets (MIS), brown creepers (MIS), northern flying squirrels, and land snails. Spruce habitat currently occupies about 26,500 acres on the Forest (USDA Forest Service 2007b). Much of the spruce habitat is currently open to cross-country travel and approximately 100 miles of motorized routes are in spruce habitat.

Hardwood Habitat

Quaking aspen and bur oak are the principle upland hardwoods (i.e., broad-leaved deciduous trees) on the Forest (USDA Forest Service 2005a). Other hardwood trees in the Black Hills include narrowleaf cottonwood, plains cottonwood, paper birch, American elm, green ash, and boxelder. Hardwood forests, with their associated understory shrub components are an important source of forage for all browsing ungulates, especially white-tailed deer. Hardwoods provide habitat for many wildlife species including elk, beaver, ruffed grouse, black-and-white warblers, butterflies, and snails. The current condition for hardwoods and associated motorized recreation is shown below.

Table 31. Miles of motorized routes in hardwood habitat on the Forest

Hardwood Cover Type	Current Acres on the Forest (USDA Forest Service 2007b)	Miles of Currently Open-Motorized Routes within Habitat
Aspen	45,560	150
Bur Oak	12,879	22
Paper Birch	3,212	6
Other Hardwoods	970	1
Total	62,621	179

Snag Habitat

Snags are an important habitat component for cavity nesting birds and mammals. The majority of snags on the Forest are ponderosa pine. The Forest currently exceeds the Forest Plan objective of three snags per acre (USDA Forest Service 2007b).

Riparian Habitat

Riparian habitat is located along the edges of streams. It is the transition zone between the aquatic habitat and the upland terrestrial habitat. Riparian habitat is important to most terrestrial and aquatic species because of its association with water. There are about 76,900 acres of riparian habitat on the Forest (USDA Forest Service 2005a). Effects to riparian habitat and the species that use it are based on acres of habitat open to cross-country travel and miles of motorized routes within 400 feet of riparian areas. The 400-foot distance was based on Forest Plan Guideline 9204 that states, if topography allows, roads should not be constructed with 400 feet of a meadow. Riparian areas include meadows although not all riparian areas are classified as meadows. Much of the riparian habitat on the Forest is open to cross-country travel and approximately 2,050 miles of motorized routes are within 400 feet of riparian areas.

Grassland Habitat

Grasslands on the Black Hills provide habitat for many wildlife species including, deer, elk, northern harrier, ferruginous hawk, and grasshopper sparrow. The most recent estimate of grassland habitat on the Forest is approximately 110,000 acres (USDA Forest Service 2007b). Much of the grassland habitat on the Forest is open to cross-country travel and approximately 650 miles of motorized routes are within grassland habitat.

Shrubland Habitat

Mountain mahogany shrublands are the most extensive shrubland type on the Black Hills and are most common in the west-central portion (east of Newcastle, Wyoming) of the Black Hills on low-elevation limestone. These shrublands are patchy and have a relatively sparse herbaceous understory dominated by side-oats grama. Three-leaved sumac is usually present in mountain mahogany shrublands and Rocky Mountain juniper and ponderosa pine occur as scattered individuals (USDA Forest Service 2005a). Mountain mahogany is a habitat component for mule deer, some open-country raptors, and other migratory birds.

Table 32. Miles of motorized routes in mountain mahogany habitat

	Current Acres on the Forest (USDA Forest Service 2007b)	Miles of Currently Open-Motorized Routes within Habitat
Mountain Mahogany	4,597	5

Management Indicator Species

The Forest Service Manual defines management indicator species as "…plant and animal species, … selected for emphasis in planning, and which are monitored during Forest Plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (FSM2620.5). Forestwide wildlife MIS are:

- Black-backed woodpecker (*Picoides arcticus*)
- Brown creeper (*Certhia americana*)
- Golden-crowned kinglet (*Regulus satrapa*)
- Grasshopper sparrow (*Ammodramus savannarum*)
- Ruffed grouse (*Bonasa umbellus*)
- Song sparrow (*Melospiza melodia*)
- Beaver (*Castor canadensis*)
- White-tailed deer (*Odocoileus virginianus*)

All Forest MIS are discussed in this document because this project covers the entire Forest. All Forest MIS occur and have habitat within the project area.

Black-Backed Woodpecker

The black-backed woodpecker was selected as a Forest MIS to address Forest condition and habitat diversity, specifically the occurrence and distribution of mature and late-successional forest, burned forest, insects, and snags on the landscape. The black-backed woodpecker is also a Region 2 sensitive species. The effects to this species are evaluated under the Sensitive Species section and in the biological evaluation.

Brown Creeper

The brown creeper is selected as a Forestwide MIS to address forest condition and habitat diversity, particularly availability of spruce and late-successional and dense mature pine stands. The brown creeper occurs in low abundance in coniferous forest in the Black Hills and is largely tied to late-successional pine and white-spruce habitats (Panjabi 2003, 2004, Giroir et al. 2007) but also occurs in other ponderosa pine successional stages (Giroir 2007). A small, well-camouflaged tree climber, the brown creeper is often observed scaling the bark of trees gleaning spiders, beetles, moths, and other insects from crevices and behind pieces of loose bark (Wiggins 2005).

The brown creeper is found most abundantly in mature, old-growth-coniferous and mixed-coniferous-deciduous forests. The preferred nesting habitat for this species is mature, old growth forest that is undisturbed and contains a closed canopy (Wiggins 2005). Brown creepers tend to prefer dense, late-successional coniferous, deciduous, or mixed habitats (Wiggins 2005). Panjabi (2001, 2003, 2004, 2005) found that brown creepers are closely associated with dense mature and late-successional ponderosa pine stands (structural stages 4C and 5) and white spruce in the Black Hills. They are also found in lower densities in other structural stages of ponderosa pine (Panjabi 2001, 2003, 2004, 2005, Giroir 2007). Evidence also suggests that this species is sensitive to the effects of forest fragmentation (Wiggins 2005).

Other important habitat requirements for the brown creeper are areas of large trees (greater than 10 inches in diameter); loose bark, areas infested with bark beetles, and snags (Wiggins 2005).

Dead or decaying trees and snags provide substrate for nests and foraging. Habitat trend appears to be stable on the Black Hills. Acres of white spruce and ponderosa pine structural stages 4C and 5 are stable, acres of ponderosa with a tree size of very large are stable, and snag density is above the Forest Plan objective (USDA Forest Service 2007b).

Brown creeper populations appear stable on the Forest. Brown creepers have been monitored on the Black Hills since 2001 in cooperation with the Rocky Mountain Bird Observatory (Panjabi 2001, 2003, 2004, 2005, Beason et al. 2006, Hutton et al. 2007, Giroir et al. 2007). Brown creepers are well distributed in low abundance throughout the Black Hills. The Migratory Bird Breeding Habitat (MBBH) program was designed to statistically detect population trends over a longer time period than the seven years that it has been implemented. Natural variability in the data and other factors preclude a short-term, meaningful analysis. However, a less rigorous analysis of the data reveals varying densities across the years, with no obvious upward or downward Forestwide population trend (USDA Forest Service 2007b). Relative densities showed a significant drop in 2007 (Blakesley et al. 2008) but it is unclear if this is annual fluctuation or the beginning of a downward trend.

Golden-crowned Kinglet

Golden-crowned kinglets were selected as Forestwide MIS to address forest condition and habitat diversity, specifically abundance, distribution, and condition of spruce habitat. Golden-crowned kinglets that breed in the Black Hills are disjunct from their main breeding range across the boreal forests of Canada and in the Western United States. The golden-crowned kinglet is an uncommon permanent resident at higher elevations in the Black Hills, where they are found primarily in white-spruce forests (SDOU 1991; Panjabi 2003, Giroir et al. 2007). Golden-crowned kinglets are uncommon in winter in the Black Hills, but are common spring and fall migrants (SDOU 1991).

Golden-crowned kinglets are found primarily in white-spruce forests (SDOU 1991; Panjabi 2003, Giroir et al. 2007). Panjabi (2003) also found them in small numbers in mature ponderosa pine, aspen, and wet meadows, although these areas likely had a spruce component. Golden-crowned kinglets on the Black Hills are likely limited by the abundance, distribution, and condition of spruce habitat. Golden-crowned kinglet habitat (white spruce) appears relatively stable or slowly increasing on the Forest (USDA Forest Service 2007b). Spruce habitat is naturally patchy and of low abundance on the Black Hills. White spruce occurs at high elevations on north aspects and in cool canyon bottoms of the Forest. MBBH data suggests the golden-crowned kinglet is distributed primarily in the northern half of the Black Hills, although it is also found in more localized areas of the central Hills and Bear Lodge Mountains as well (USDA Forest Service 2007b).

Golden-crowned kinglets have been monitored on the Black Hills National Forest since 2001 in cooperation with the Rocky Mountain Bird Observatory (Panjabi 2001, 2003, 2004, 2005, Beason et al. 2006, Hutton et al. 2007, Giroir et al. 2007). The MBBH program was designed to statistically detect population trends over a longer time period than the seven years that it has been implemented. However, a less rigorous population trend analysis suggests an increase through 2006 (USDA Forest Service 2007b). Habitat trend for the golden-crowned kinglet has increased over the long term. Recent trends appear to be stable (USDA Forest Service 2007b).

Grasshopper Sparrow

Because of its association with intermediate and taller vegetation, the grasshopper sparrow habitat and/or population trends are likely a good indicator of prairie grassland habitat condition.

The grasshopper sparrow was selected as an MIS on the Forest to address abundance, distribution, and condition of grassland habitat. The grasshopper sparrow is also a Region 2 sensitive species. The effects to this species are evaluated under the Sensitive Species section and in the biological evaluation.

Ruffed Grouse

The ruffed grouse was selected as an indicator of aspen quantity and vigor in pure and mixed stands. Ruffed grouse was selected as an MIS for the Forest to address forest condition and habitat diversity, specifically aspen distribution and condition. Ruffed grouse is a year-round resident in the Black Hills and occurs widely but in low abundance (Panjabi 2003). Ruffed grouse is classified by state wildlife agencies (South Dakota and Wyoming) as an upland game bird. There is an annual fall hunting season for these birds. Distribution on the Black Hills roughly correlates to the distribution of Aspen. Aspen is more abundant in the northern and central Black Hills and Bear Lodge Mountains. Aspen becomes sparse in the southern Black Hills.

Ruffed grouse are strongly associated with aspen throughout much of their range (Wiggins 2006). Ruffed grouse use a variety of aspen age classes for foraging, nesting, brood rearing and predator avoidance (ibid.). Ruffed grouse nest in forests or woodlands with some deciduous trees and is closely associated with hardwoods, particularly aspen (ibid.). On the Forest, this species is associated with aspen in a variety of structural stages. The species feeds on aspen buds and catkins in the winter and spring, respectively (ibid.). In South Dakota, ruffed grouse is typically found in young to medium-age aspen stands, other hardwood stands, and open pine forests (SDOU 1991). The Forestwide habitat trend loss of aspen over the past 11 years is slightly downward (USDA Forest Service 2007b). Aspen stands have been replaced by pine and spruce in many areas of the Forest, and may have declined since pre-settlement times (Parrish et al. 1996), resulting in a net loss of ruffed grouse habitat.

Although quantitative data are lacking, grouse appear to be less common in the Black Hills than they were historically (Wiggins 2006). The Forest is currently working with the South Dakota Game, Fish, and Parks and the Forest Service's Rocky Mountain Research Station to develop a new monitoring protocol for ruffed grouse. Data was collected for the first time in 2007. Preliminary data from 2007 show a probability of occupancy of 0.133 (Hansen et al. 2008). This data would serve as baseline data for future trend assessments.

Song Sparrow

The song sparrow was selected as an MIS for the Forest to address riparian condition. This species is expected to be a good supplemental indicator of riparian habitat condition in addition to Beaver. Song sparrows are found throughout much of the Black Hills, but are more common in the north part. Song sparrows occur mainly in streamside thickets, especially willows, and are dependant upon these habitats (Panjabi 2001). Panjabi (2001, 2003) found them in the highest density in riparian habitat. Song sparrows were also found in white spruce adjacent to riparian stringers.

The song sparrow breeds in a wide range of forest, shrub and riparian habitats, but in dry areas is normally limited to those close to fresh water (Arcese et al. 2002). Year-round residents are often found near breeding areas during winter (Arcese et al. 2002). The highest densities have been found in riparian habitat (Panjabi 2001, 2003; Hutton et al. 2007; Giroir et al. 2007). Riparian areas account for approximately 1 percent of public and private land in the Black Hills and are typically located adjacent to streams and around natural springs, seeps, fens, and reservoirs. Due

to the presence of water, these areas frequently receive a disproportionate amount of use from wildlife, livestock, and humans.

Riparian habitats have decreased in quality since the pre-European settlement era, indicating a long-term declining habitat trend. More recent, shorter-term riparian trends are unclear. Small riparian protection projects have improved riparian conditions in some areas.

Song sparrows have been monitored on the Black Hills since 2001 in cooperation with the Rocky Mountain Bird Observatory (RMBO; Panjabi 2001, 2003, 2004, 2005, Beason et al. 2006, Hutton et al. 2007, Giroir et al. 2007). The MBBH program was designed to statistically detect population trends over a longer time period than it has been implemented. However, a less rigorous analysis of the data suggests a stable Forestwide population trend since 2003 (USDA Forest Service 2007b).

Beaver

Beaver was selected as an MIS for the Forest to address hardwood and riparian/aquatic habitat condition. This species was selected due to its relationship to riparian/aquatic habitat condition, status as a keystone species, available monitoring protocols, and dependence on riparian forest and shrub habitat. Beavers are found in suitable habitat throughout much of North America, ranging as far south as northern Mexico; they are widely distributed throughout South Dakota. The beaver is North America's largest rodent, with adults weighing 30 to 60 pounds (Higgins et al. 2000). Beavers are semi-aquatic and widely distributed in large rivers and lakes with constant water levels, marshes, small lakes, and streams with weak flows adequate for damming (ibid.).

Beavers are adversely affected by predation, loss of food base due to wildfire or habitat overuse, and drought. Direct impacts to beavers by humans typically are caused by trapping and hunting. Indirect impacts to beavers are any impacts that affect their specific habitat requirements for perennial water and deciduous riparian woody vegetation.

General habitat requirements of beavers include suitable riparian habitat dominated by stands of willow, aspen, or cottonwood (Olson and Hubert 1994). Beavers are not found in areas without permanent water and suitable woody vegetation; they build dams by cutting down trees and shrubs and packing mud between the branches. They also build lodges with feeding and sleeping chambers that are accessed through underwater entrances. The beaver is nocturnal and active year-round. It is vegetarian, preferring aspen, willow, cottonwood, and alder (Higgins et al. 2000).

At one time, beavers were likely the most important biological influence on riparian systems of the Forest. Through dam construction, they can enhance and maintain aquatic and riparian communities by elevating water tables; reducing stream velocity and subsequent sedimentation and bank erosion; improving water quality; improving stream flow stability; and enhancing fish and wildlife habitat (Olson and Hubert 1994).

Riparian habitats have decreased in quality since European settlement, and the total amount of aspen has decreased over at least the past 30 years. Both of these indicate a long-term declining habitat trend for beaver. More recent, shorter-term riparian trends are unclear. Small riparian protection projects on the Forest have improved riparian conditions in some areas (USDA Forest Service 2007b).

Historically, beaver were heavily trapped in the Black Hills. By the late 1880s, populations were low and restricted to remote areas (Parrish et al. 1996). Beaver have increased since then and are

now widely distributed in both South Dakota and Wyoming. Beaver can be legally harvested in both states, but hunting regulations moderate the effect on populations. Limits to persistence include degradation and/or loss of riparian shrubs and forests due to historical management activities, as well as the loss of hardwood components on adjacent uplands. Baseline beaver surveys were conducted on the Forest during September 2004 (USDA Forest Service 2007b). Beaver and their habitats were most common in the Bear Lodge Mountains and in the central Black Hills, although they were present in other areas as well. A total of 74 active and 5 inactive beaver colonies were observed on National Forest System lands during aerial and ground-based surveys.

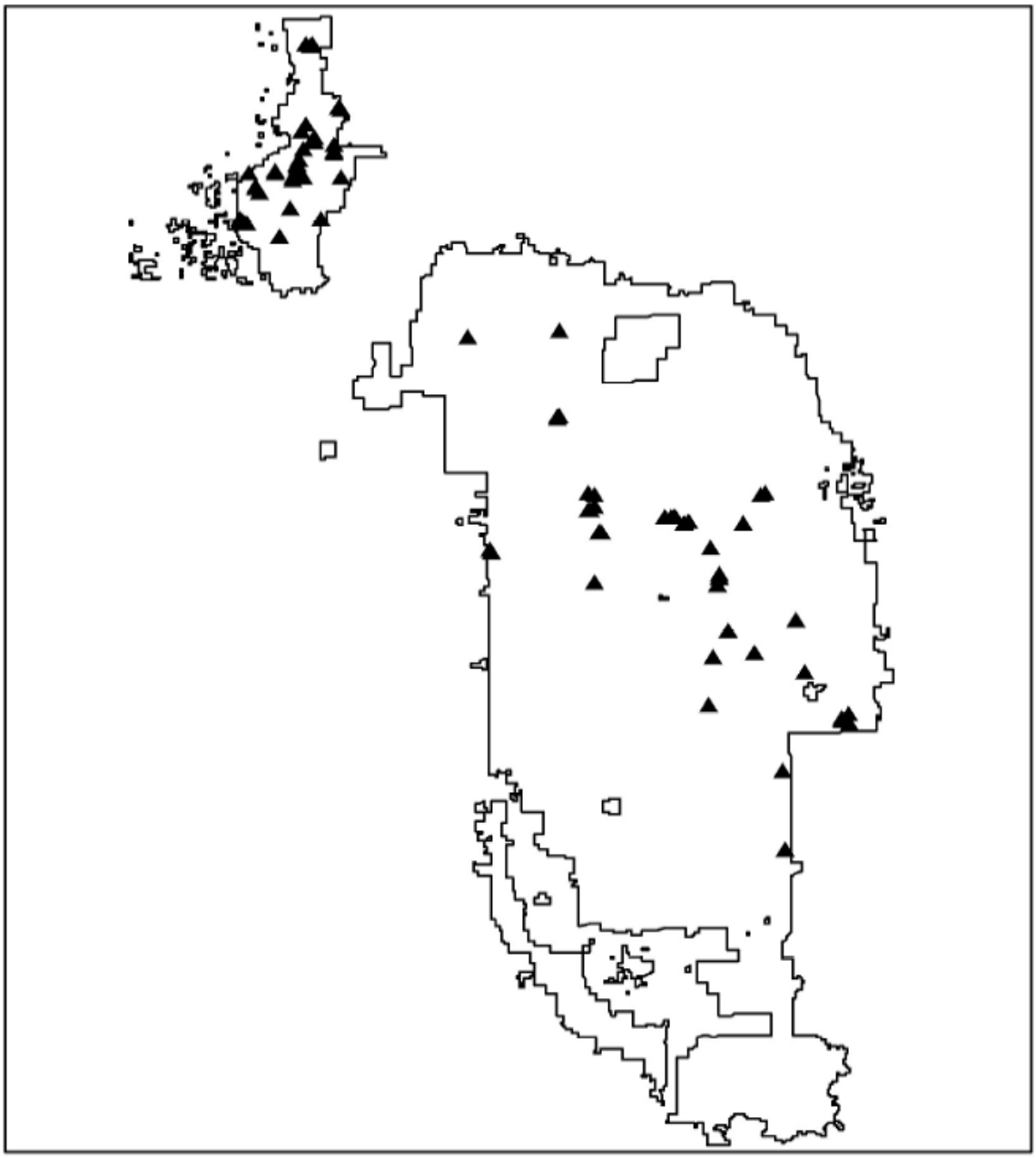

Figure 15. General distribution of beaver on the Black Hills National Forest (Source: NRIS Fauna database)

White-tailed Deer

White-tailed deer were selected as an MIS for the Forest to address forest condition and habitat diversity, including the occurrence of understory shrubs. White-tailed deer occur throughout most of the United States and southern Canada and occupy a wide range of habitats. In the Black Hills, they are associated with forested habitat (conifer and hardwood) in close proximity to water (SAIC 2003). White-tailed deer are mostly migratory in the Black Hills, using lower elevations in winter (Stefanich 1995). White-tailed deer move to low-elevation winter range from October to January, the timing of which depends on snow and forage conditions (Stefanich 1995; Griffin et al. 1999). Wooded draws and pine stands with closed canopies provide thermal cover while agricultural areas and recently logged and open stands with abundant shrubs are important for forage. Bearberry juniper and snowberry provide important winter browse (DePerno et al. 2002).

White-tailed deer in the Black Hills require a diversity of habitat types. Juxtaposition between cover and forage for the white-trail deer is crucial year-round. Hardwood stands, which provide abundant forage combined with screening cover, were best predictors of white-tailed deer diurnal, summer use (Stefanich 1995). Peak use of dense aspen habitats with dense, tall shrub cover indicated importance as fawning habitat in the northern and central Black Hills (DePerno et al. 2002). Summer nocturnal habitat use is significantly different with use of open habitat types of meadows, riparian areas, and/or open pine relative to proximity of dense cover (Stefanich 1995). Wet meadows, riparian areas, and open stands of ponderosa pine also provide quality forage and water.

In winter, white-tailed deer in the central Black Hills selected forested habitat with shrubs 1.5 to 4.7 times more frequently than shrub habitats occurred on the Forest (DePerno et al. 2002). Uresk and Severson (1998) found that open-canopy conditions are necessary to get to understory shrubs. Closed-canopy stands with minimal understory vegetation represent cover.

Another factor that can affect deer habitat is road construction and road density. High road densities (miles of road/square mile area) alter both human and animal behavior, which contribute to animal displacement and stress (SAIC 2003). Roads may cause a direct loss in habitat and increased vehicular volume may indirectly degrade habitat quality. In the 1990s, up to 1,400 deer per year were killed in vehicle collisions in the Black Hills (Parrish et al. 1996).

The Arc Habitat Suitability Index (ArcHSI) model was used to provide an index to Forestwide deer habitat conditions in 2005. The Forestwide summer habitat trend is increasing, and winter habitat trend is stable to slightly decreasing (USDA Forest Service 2006b). The South Dakota white-tailed deer population has increased since 2000. In 2005, there were an estimated 50,000 white-tailed deer (USDA Forest Service 2007b). The Wyoming Game and Fish (WGF) Department models estimate that there are about 40,000 white-tailed deer in the Black Hills herd unit that includes both private and Forest lands (Sandrini 2007a). The population may be beginning to grow based on field personnel observations (Sandrini 2007a).

Threatened and Endangered Species

The purpose of this section is to analyze and determine effects of the alternatives on species listed as endangered, threatened, or proposed under the Endangered Species Act. The black-footed ferret is the only threatened, endangered, or proposed species located on the Forest, or located adjacent to project area that could potentially be affected. The species was identified through informal consultation with the South Dakota and Wyoming field offices of the U.S. Fish

and Wildlife Service (USDI Fish and Wildlife Service 2007a, 2007b). No designated critical habitat for the black-footed ferret is presently located on lands administered by the Forest.

Black-footed Ferret

Black-footed ferrets (*Mustela nigripes*) are federally endangered throughout their former range. In Wyoming, there are historic records of ferrets in the Black Hills area (Luce et al. 1999). Ferrets have recently been released in Wind Cave National Park in the southern Black Hills. The black-footed ferret is a nocturnal, solitary carnivore with the narrowest range of ecological tolerance of any North American predatory mammal (USDA Forest Service 1996a Appendix H). In the Black Hills, as elsewhere, the key habitat component for black-footed ferrets is the distribution and abundance of prairie dogs (Forrest et al. 1985), its primary food source (see discussion for Black-tailed prairie dog on p. 169). Vacated prairie dog burrows also provide shelter.

One prairie dog town is located near Wind Cave National Park. It is located in the small section of Norbeck Wildlife Preserve (Section 2) near the boundary between Wind Cave National Park and Custer State Park and is about 13 acres in size. Ferrets could move out of Wind Cave National Park and into this prairie dog town. Norbeck Wildlife Preserve is currently not open to public motorized travel.

Region 2 Sensitive Species

Region 2 sensitive species are those plant and animal species identified by the Regional Forester for which population viability is of concern, as evidenced by significant current or predicted downward trends in population numbers or density, or in habitat capability that would reduce a species' existing distribution (USDA Forest Service 2007c). Table 33 lists wildlife and fish species designated as sensitive species Region 2 of the United States Forest Service (USDA Forest Service 2007c) known or likely to occur on the Forest.

Cooper's Rocky Mountain Snail

Anderson (2004) lists Cooper's Rocky Mountain snail (*Oreohelix cooperi*) as the only *Oreohelix* in the Black Hills. Anderson (2004) also notes the taxonomy of this species is confusing with the species often classified as *Oreohelix strigosa cooperi*. Anderson et al. (2006) and Weaver et al. (2006) found only one species in the Black Hills, and referred it as *O. cooperi*. For the purposes of this analysis, we consider the two species to be one and the same as suggested by Anderson et al (2006), but refer to it here as *O. strigosa cooperi* since that is the label used on Region 2 sensitive species list. Anderson et al. (2006) consider this snail to be widely distributed in the Black Hills. Cooper's snail also occurs in the Judith Mountains in Montana and in the Bighorn Mountains in Wyoming (Anderson et al. 2006, Weaver et al. 2006).

In 2002, the Forest received the final report for a contract to inventory and/or monitor 357 sites for land snails (Frest and Johannes 2002). Many of the sites had been surveyed in the early to mid-1990s, and some were revisited in 1999 to help assess population changes. More than 100 new sites were inventoried for the first time. A total of 38 species were identified, including 12 not documented previously in South Dakota. The surveys also provided information on Cooper's mountain snail. Cooper's snail was found at 109 sites. Locations are concentrated in the northern, central and western Black Hills (Anderson 2004, 2005).

Table 33. Forest Service Region 2 sensitive species analyzed

Scientific Name	Common Name
Invertebrates	
Oreohelix strigosa cooperi	Cooper's mountain snail
Speyeria idalia	regal fritillary
Reptiles	
Storeria occipitomaculata pahasapae	Black Hills redbelly snake
Amphibians	
Rana pipiens	Northern leopard frog
Birds	
Haliaeetus leucocephalus	bald eagle
Circus cyaneus	northern harrier
Accipiter gentilis	northern goshawk
Buteo regalis	Ferruginous hawk
Falco peregrinus	peregrine falcon
Coccyzus americanus	yellow-billed cuckoo
Athene cunicularia	burrowing owl
Otus flammeolus	flammulated owl
Melanerpes lewis	Lewis' woodpecker
Picoides dorsalis	three-toed woodpecker
Picoides arcticus	black-backed woodpecker
Lanius ludovicianus	loggerhead shrike
Numenius americanus	long-billed curlew
Ammodramus savannarum	grasshopper sparrow
Charadrius montanus	mountain plover
Mammals	
Myotis thysanodes	fringed myotis
Corynorhinus townsendii pallescens	Townsend's big-eared bat
Martes americana	American marten
Ovis canadensis	Rocky Mountain bighorn sheep
Cynomys ludovicianus	black-tailed prairie dog

The following discussion is based on information from the Black Hills (Frest and Johannes 2002). Cooper's snail was found on calcareous soils; most localities were lowland wooded areas and talus slopes, generally but not always with northern or eastern exposures. Many of the colonies, including most of the largest, are found in ponderosa pine with a partially closed canopy, a secondary deciduous tree component, and diverse understories. At some sites, white spruce was common. Riparian woodland communities, often in areas with adjacent steep rocky slope bases, were also found to contain some substantial colonies. This species generally dominates the mollusk fauna in the area of occurrence, but it has been found to occur with two other species of land snail: the callused vertigo and striate disc.

Litter is an important component for snails as food and cover. In general, snails prefer a well-developed litter layer, but not thick or matted (Anderson 2005). In contrast to other land snails, Cooper's snail can thrive with little cover and thin litter (ibid.). Oreohelix have been observed in a variety of litter types in the Black Hills, including coniferous needles litter, deciduous litter, and areas of thin litter (ibid.).

Road construction and maintenance can affect snails by eliminating habitat or killing snails. Roadside brushing or weed spraying can also damage snails and/or their habitat (ibid.). Several known locations of Cooper's snail are near roads.

Regal Fritillary Butterfly

The Black Hills are at the western margin of the regal fritillary's range, possibly due to increased aridity further west (USDA Forest Service 2000b). The regal fritillary requires open prairies (Royer and Marrone 1992). In South Dakota, the fritillary is most likely to be found in native tall-grass prairies composed of big bluestem (*Andropogon gerardii*), western wheatgrass (*Pascopyrum smithii*), and green needlegrass (*Stipa viridula*) (ibid.). Continuous prairie greater than 1,000 acres may be required for stable populations (ibid.). In smaller habitat patches, individuals would move in and out depending on habitat condition and size (Royer and Marrone 1992, USDA Forest Service 2000b). The Black Hills is primarily forested, and as such, contains only relatively small patches. The best habitats within the Black Hills occur in lower elevation prairies along the outer Forest boundary and in interior prairies, although tall-grass species are not predominant in the interior prairies.

Adult female regal fritillaries lay eggs near violets. During the following spring, the larvae feed exclusively on violet leaves. By late June or early July, juveniles transform to adults (Royer and Marrone 1992). Adults require a continuous source of nectar-producing flowers such as coneflowers, fleabanes, and thistles (ibid.).

The primary factor affecting long-term populations is thought to be conversion of native tall-grass prairie habitats to cropland and pasture, which primarily occurs on private lands. It is estimated that one-half to two-thirds of the regal fritillary's original range has been converted to cultivated cropland, making it a species that is considered rare rangewide (USDA Forest Service 2000b). Another risk to this butterfly is exotic weed invasion into prairie habitat (Royer and Marrone 1992).

Northern Leopard Frog

Northern leopard frogs are considered common in suitable habitat in the Black Hills and are found at all elevations, though systematic surveys have not been done in the Black Hills to verify this (Smith 2003). The northern leopard frog appears to be more common in the northern Black Hills. In the Black Hills, it is believed this species has been reduced from its historical abundance due to the loss of wetlands, though population trend and size are speculative due to lack of information (ibid.).

The northern leopard frog occurs in a wide variety of habitats including creeks, lakes, ephemeral wetlands, and ponds. Emergent vegetation is important in providing protective cover in ponds and lakes that contain predatory fish. After maturing, sub-adult frogs migrate to suitable feeding sites that are usually adjacent uplands. These dispersal movements may be along riparian corridors or upslope areas. After breeding, adult frogs can be found feeding in upland habitats of grasslands, meadows, and pastures adjacent to breeding areas. Adult frogs are highly mobile. They have been found up to two miles from water (Smith 2003).

Risk factors identified by Smith (2003) include inadequate regulatory protection of smaller (less than 12 acres) seasonal and semi-permanent ponds, introduced predatory fish, lack of protection at overwintering sites, water quality degradation due to chemicals, loss of migratory pathways, introduced diseases, and road-related mortality.

Roads can cause substantial direct mortality from road-kill events (Smith 2003, Smith and Keinath 2007). Roadways can also fragment habitat and alter frog dispersal patterns. Road construction also causes siltation, which can smother eggs. Runoff from roads can carry oil and other automotive pollutants into waterways, adversely affecting frog populations (Smith and Keinath 2007).

Black Hills Redbelly Snake

The redbelly snake is a nocturnal and secretive snake found in moist sites from the western foothills, the limestone plateau, and the central core of the Black Hills (Smith and Stephens 2003). Sites where the snake has been observed range in elevation from 4,700 to 6,400 feet (Peterson 1974). The Black Hills subspecies of the redbelly snake is an isolated population with the nearest population of redbelly snakes about 300 miles east near Aberdeen, South Dakota (USDA Forest Service 2000b). Biological expert interviews (USDA Forest Service 2000b) suggest that the redbelly snake is reasonably common in the Black Hills.

Although the redbelly snake does not appear to be in danger of extirpation, the population in the Black Hills is an isolated subspecies and endemic to the Black Hills (USDA Forest Service 2000b). Little demographic and population trend data are available specific to the Black Hills population (Smith and Stephens 2003). This subspecies is considered one of the most poorly understood snakes of North America (Bartlett and Tennant 2000).

Several den sites have been found in the Black Hills with hibernacula located within rock fissures (USDA Forest Service 2000b). Observations are concentrated in the central and northern portions of the Black Hills. The southern portion of the Black Hills is drier, which may affect distribution.

Black Hills redbelly snakes are associated with mesic sites such as wetlands, riparian areas, and wet meadows (USDA Forest Service 2000b). The most serious risk to redbelly snakes populations may be the loss of mesic habitats (Smith and Stephens 2003). Suitable environments for redbelly snakes are thought to be abundant and broadly distributed across the Black Hills (USDA Forest Service 2000b). The northern Black Hills, being generally moister and more fire-resistant than the rest of the Forest, likely provides more habitat than other districts of the Forest (USDA Forest Service 2000b). Stumps and downed woody material are important in maintaining moist conditions; as roots of stumps decay, they provide cover (USDA Forest Service 2000b, Smith and Stephans 2003).

Road construction and off-highway vehicles can impact redbelly snakes. These activities involve the displacement and/or compaction of large amounts of soil, removal of ground litter and other debris, and potentially loss of mesic habitat (Smith and Stephans 2003). Direct mortality has been observed on existing roads and motorized routes.

American Three-Toed Woodpecker

The main range of the three-toed woodpecker extends through the Rocky Mountains and laterally across Canada to northern New England (Leonard 2001). The Black Hills population is isolated from the main range by nearly 200 miles. In South Dakota, this woodpecker is considered a rare yearlong resident limited to the higher elevations of the Black Hills (South Dakota Ornithologist's Union 1991). The three-toed woodpecker may also be found at lower elevations, especially in winter (ibid.). The three-toed woodpecker population trend has been relatively stable in both the northern Rocky Mountains and Badlands/Prairies physiographic

regions. However, Breeding Bird Survey data suggests there may be isolated local declines (Sauer et al. 2001).

In a baseline study of three-toed woodpecker populations in the Black Hills, Mohren (2002) estimated that approximately 320 to 440 birds occurred here in 2000-2001, with an average Forestwide density of 1 bird per 3,088 acres (0.08 birds/km^2). The estimate applies across all habitat types on the Forest, including forest types that the species does not typically inhabit (e.g., pure ponderosa pine). According to Mohren (2002), the Forestwide density estimate was similar to what has been recorded in other unburned habitats across the species range.

Late successional spruce-fir forest represents the core breeding and feeding habitat for the species (Wiggins 2004). To date, monitoring results show areas in or adjacent to mature white spruce stands harbor the highest three-toed woodpecker densities in the Black Hills. Relative densities in spruce habitats range from 1 bird per 137 acres (1.8 birds/ km2) to 1 bird per 68 acres (3.64 birds/km^2) (USDA Forest Service 2007b). These figures are 23 to 45 times higher than Mohren's (2002) Forestwide average. Birds were also found in late-successional pine habitats and riparian habitats but in much lower densities than in white spruce. Also, spruce trees were usually present in those other habitat types where the woodpeckers occurred.

Spruce habitat is naturally patchy and of low abundance on the Black Hills. White spruce occurs at high elevations, on north aspects, and in cool canyon bottoms of the Forest. Fire suppression during the last century has allowed spruce to increase in abundance and density in the Black Hills, generally at the expense of quaking aspen (Parrish et al. 1996). The white-spruce cover type now occurs on 25,000 acres of the Forest. Approximately 90 percent of the spruce on the Forest is in mature or late-successional condition (structural stages 4 and 5) and likely provides high-quality habitat for three-toed woodpeckers. Three-toed woodpeckers nest mainly in snags but would use live trees, especially those with heart rot. Species of nest trees vary and include hardwoods as well as conifers. Optimal habitat includes areas with 42 to 52 snags per 100 acres, occurring in clumps (Nicholoff 2003). The most important snags are 12 to 16 inches dbh, 20 to 40 feet tall, and have bark still present (Nicholoff 2003).

Bald Eagle

Bald eagles are present in the Black Hills during winter, usually arriving in early November (USDA Forest Service 1996a, Appendix H) and leaving by March or April. The bald eagle was formerly a rare breeder in the southeastern portion of South Dakota (South Dakota Ornithologist's Union 1991). An unsuccessful nesting attempt was reported adjacent to the Forest in the Southern Hills in spring 2004. In 2007, an unsuccessful nest attempt occurred at Deerfield Lake on the Forest. This was the first nest attempt on the Forest in recent times. The bald eagle nest is again active in April 2008. Most suitable nesting habitat occurs around the major reservoirs or along major creeks in the Black Hills.

Prior to 2006, there were no known traditional (repeated use) or communal roost sites in the Black Hills. In 2006, a night roosting area was discovered at Pactola Reservoir. Approximately 18 to 22 eagles were observed at the roost on four separate occasions between late December 2005 and late January 2006. The roost covers at least 100 acres of mature to late-successional ponderosa pine forest on very steep slopes. Large trees and snags are abundant. The site is adjacent to Pactola Reservoir, parts of which were not frozen during the time of the discovery. Further monitoring of this roost is needed to clarify the full extent of the roost and its importance to bald eagles (USDA Forest Service 2007b).

Key winter habitat components for the bald eagle on the Forest include perch sites, roost sites away from human disturbance, and an adequate food supply. The ponderosa pine landscape provides suitable roosting habitat. A small population of eagles does winter on the Black Hills. This small population appears to rely mainly on a dependable supply of carrion, especially deer and small mammals killed by vehicle traffic. Bald eagles are frequently observed feeding on carcasses along roads.

Black-Backed Woodpecker

The main range of the black-backed woodpecker is in the northern Rocky Mountains and across Canada (Dixon and Saab 2000). In South Dakota, this woodpecker is known only in the Black Hills, where it is considered an uncommon yearlong resident (SDOU 1991). In Wyoming, the species occurs in the northeastern portion of the state as well as in the Black Hills and Bear Lodge Mountains. In the Black Hills, black-backed woodpecker distribution and abundance is closely associated with recent stand-replacing fires (Panjabi 2001, 2003, 2004, 2005, Giroir et al. 2007) and insect outbreaks (Bonnot 2004, Rumble 2002). They also occur at much lower densities throughout the remainder of the Forest (Mohren 2002; Panjabi 2001, 2003, 2004, 2005, Giroir et al. 2007).

In the Black Hills, black-backed woodpeckers are associated with ponderosa pine habitats that have high populations of their main prey: the larvae of wood-boring beetles, engraver beetles, and bark beetles (Anderson 2003). Recently burned pine forests and areas infested with mountain pine beetles are most preferred by black-backs. The species can also be found in forests that are relatively unaffected by beetles, but it is relatively rare in such places.

Unburned pine stands infested with mountain pine beetles (bark beetles) are also important to black-backed woodpeckers. Rumble (2002) found that the density of black-backed woodpeckers in the heavily infested Beaver Park area was approximately seven times greater than what Mohren (2002) found across all habitats in the Black Hills. The core of the infestation had densities that were 32 times higher than the Forestwide average; this is the highest density recorded on the Forest although it occurred over a fairly small localized area.

In unburned, uninfested pine habitat of the Black Hills, black-backed woodpeckers select mature or late-successional pine stands with high canopy cover, high tree densities, and high snag densities (Mohren 2002; Panjabi 2001; Panjabi 2003; and USDA Forest Service 2000b). These conditions are found primarily in structural stages 4C and 5. Black-backs also use sapling-pole stands with any amount of canopy cover (i.e., structural stages 3A, 3B, and 3C), but to a lesser degree than any of the other habitat structures mentioned thus far (Mohren 2002, USDA Forest Service 2000b). Mohren (2002) reported that black-backed woodpeckers avoid mature pine stands that do not have high canopy cover (i.e., structural stages 4A and 4B). Black-backed woodpeckers nest in hard snags or live trees with diameters of 9 to 18 inches (Anderson 2003). Ponderosa pine appears to be the most important nest tree in the Black Hills, as all recent studies report nests in only that species (Vierling 2004; Mohren 2002; Rumble 2002).

Burned habitat has declined because large fires that burned prior to 2002 have aged and become less valuable as black-backed habitat. Still, because of other fires since 2002, there is a relatively high amount of potential habitat available on the Forest. Habitat provided from mountain pine beetle is abundant when compared to 10 years ago and appears to be increasing.

Forestwide habitat conditions have been favorable for the black-backed woodpecker over the past few years due to numerous large fires and beetle outbreaks. Habitat is relatively abundant

when compared to 10 to 25 years ago. In the past few years, the habitat trend appears to be stable as recently burned areas have declined (aged) and insect caused tree mortality continues to increase. The addition of recent wildfires and insect tree mortality results in above 3 snags per acre (Forest Plan Objective 211) well dispersed across the Forest (USDA Forest Service 2007b).

In his baseline population study, Mohren (2002) estimated that approximately 1,200 black-backed woodpeckers occurred in the Black Hills during 2000, with an average Forestwide density of one bird per 883 acres (0.28 birds/km^2). The estimate applied across all habitat types on the Forest, excluding large recent burns, which did not exist at the time. According to Mohren (2002), the Forestwide density estimate was similar to what has been recorded in other unburned habitats across the species range. Since Mohren's first estimate was derived, several large fires occurred in the Black Hills, which has undoubtedly increased the black-backed woodpecker population. Black-backed woodpeckers have been monitored on the Black Hills since 2001 in cooperation with the Rocky Mountain Bird Observatory (Panjabi 2001, 2003, 2004; Beason et al. 2006, Hutton et al. 2007, Giroir et al. 2007). Monitoring was focused on burned habitat in the Jasper Fire, which burned in 2000.

It appears that black-backed woodpecker densities peaked in the 2000 Jasper Burn during the second post-fire year when one bird per 36 acres (or 6.9 birds/km^2) were observed (Panjabi 2003). This is nearly 25 times higher than what Mohren (2002) found as a Forestwide average. One year later, densities in the Jasper Burn had declined by nearly half (Panjabi 2004), but they were still much higher than what has been found in other habitats. Relative densities in burned habitat have continued to decline in the Jasper Burn as expected following a fire (USDA Forest Service 2007b).

Burrowing Owl

The western burrowing owl is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation and bare ground (Klute et al. 2003). The northern populations of owls are migratory and may winter in the southwestern U.S. and Mexico (Johnson and Anderson 2002). Numerous authors have identified elimination of burrowing rodents through control programs as the primary factor in the recent and historical decline of burrowing owl populations (Klute et al. 2003).

Burrowing owl nesting habitat typically consists of level, open landscapes with sparse grassland vegetation that either has low structure or is heavily grazed (Johnsgard 1988), either by cattle or prairie dogs (Klute et al. 2003). They are dependent on burrowing mammals whose vacant burrows are used for nesting and roosting; the burrows of prairie dogs, particularly black-tailed prairie dogs, are of central importance (Johnson and Anderson 2002, Klute et al. 2003).

While burrowing owls nest and roost in shortgrass habitats, they forage over a variety of habitats including tall grass, cropland, and fallow fields (Klute et al. 2003). A mosaic of grassland habitats is therefore important to provide suitable nesting and foraging habitat diversity. Habitat for burrowing owls on the Forest is limited; the availability of black-tailed prairie dog colonies may be the greatest limiting factor (Johnson and Anderson 2002; see p. 169 for discussion on prairie dog colonies).

A burrowing owl was observed in 2002 (Panjabi 2003), and another observation occurred on the Forest in June 2004 by the Rocky Mountain Bird Observatory during ongoing breeding bird monitoring. The 2004 observation was associated with a prairie dog town on the Hell Canyon Ranger District. Seven burrowing owls were observed on the Forest in 2006. Two adults and

three chicks were observed at two nests. These are the first nesting burrowing owls documented on the Forest for quite some time (USDA Forest Service 2007b).

Ferruginous Hawk

The ferruginous hawk ranges through most of the western United States. Its breeding range extends from northern Arizona, New Mexico, and Texas north to southern Canada (Collins and Reynolds 2005). The bird winters primarily from the southwestern and south central United States south to central Mexico (Collins and Reynolds 2005). In South Dakota, it is considered an uncommon to fairly common summer resident in prairies, chiefly in the western but also northeastern part of the state (South Dakota Ornithologist's Union 1991). In Wyoming, ferruginous hawks are a common resident, with breeding records across most of the state, but there is a noticeable drop in numbers in the winter (Luce et al. 1999).

Rangewide, ferruginous hawks occupy a variety of habitat types including open grasslands, shrub-steppe, croplands and desert (Collins and Reynolds 2005). Ferruginous hawks prefer open rolling or rugged terrain and avoid high elevations, forest interiors, narrow canyons, and cliffs (Collins and Reynolds 2005), which may account for their rarity in the Black Hills. The most recent estimate of grass cover-types on the Black Hills is approximately 110,000 acres (USDA Forest Service 2007b). Prairie grasslands refer to those grasslands that generally occur on the outer perimeter of the Black Hills as a transition between the true prairie ecosystems and the forested ecosystems of the foothills and mountains. Interior grasslands occur within the forested perimeter of the Black Hills and can include large areas dominated by plant species typically associated with prairie systems (e.g., Reynolds and Gillette Prairies).

Disturbance during the nesting period has been identified as a risk to the species. The increased use of recreational vehicles, such as all-terrain vehicles is a source of human disturbance that can have negative consequences for ferruginous hawks. Recreational vehicles can cause habitat alteration through the destruction or degradation of vegetation structure. Noise and other disturbances associated with motorized recreation can have equally important effects on individual ferruginous hawks physiologically, and may reduce productivity at nest sites (Collins and Reynolds 2005).

Flammulated Owl

The flammulated owl breeds in mountain ranges from Central America north through the western U.S. to southern British Columbia; it winters from Mexico into Central America (Johnsgard 1988; Sibley 2000). In the United States and Canada, it lives in montane forest habitats dominated by yellow pines (i.e., ponderosa and Jeffrey). Distribution of the owl is scattered as a consequence of habitat distribution and the bird's less-than-full occupation of yellow pine habitats (Hayward and Verner 1994). The species is conspicuously absent from various yellow pine forests in the western United States, including ponderosa-pine forests in Wyoming (e.g., Bighorn Mountains) and eastern Montana.

In their rangewide assessment of the owl, Hayward and Verner (1994) specifically noted that the species was not present in the Black Hills despite the availability of seemingly suitable ponderosa pine habitat. Other accounts support the absence by failing to mention species presence (e.g., South Dakota Ornithologist's Union 1991; Peterson 1995; Luce et al. 1999). However, there have been two reports of flammulated owls in the past 10 years that could be valid sightings. These reports could represent periodic use by transient individuals, or the beginning of a range expansion. Establishment of flammulated owls in newly occupied habitat could take many years, because the species has a low reproductive potential (Hayward and

Verner 1994). A concerted effort was made to verify flammulated owls, at the two recent observation areas and other seemingly suitable sites during 2003 but the species were not detected (Fauna West Wildlife Consultants 2003).

Flammulated owls are associated primarily with ponderosa pine and Jeffrey pine habitats. In the Black Hills, only ponderosa pine is present. Flammulated owls select older seral stages for breeding and nesting (Hayward and Verner 1994). They are often associated with old-growth forests. Interior and exterior forest edge seems to be a desirable if not necessary component of flammulated owl habitat (ibid.). Clumped tree distributions, multi-layered canopy, and a well-developed shrub component contribute to internal forest edge. Low-to-moderate canopy closure prevails in most sites used by the owl (ibid.). The ponderosa pine structural stages corresponding most closely to potential flammulated owl nesting and foraging habitat on the Forest are 4A, 4B, and 5.

Flammulated owls appear to prefer denser vegetation for roosting (Hayward and Verner 1994). Across the species range, they have been found roosting in mixed-conifer stands, thickets, and other conditions with high foliage density or multi-layered canopy that were in close proximity to nest sites (e.g., greater than 300 feet). In Oregon and Colorado, the species did not select pure stands of ponderosa pine for roosting but instead used mixed-conifer stands where pine was a component (Hayward and Verner 1994). Roosting habits are unknown in the Black Hills, but if rangewide patterns hold true here, the species may roost in spruce or in stands where pine and spruce both occur. In their summary of nest site characteristics across three studies in New Mexico and Oregon, Hayward and Verner (1994) found that the owls occurred in snags that averaged between 19 and 28 inches dbh.

Grasshopper Sparrow

In Wyoming, the grasshopper sparrow breeds mainly in the eastern portion of the state, and occurs almost statewide except in the south central portion (Luce et al. 1999). In South Dakota, there are breeding records throughout the state, including the Black Hills (Peterson 1995). It is considered an uncommon to common summer resident (SDOU 1991). It occurs widely in native mixed-grass prairies in the southern Black Hills, and locally further north in the central Black Hills (Panjabi 2005). Panjabi (2005) found them in the highest density in mixed-grass prairie habitat. They may also occur in other types of grasslands (Panjabi 2003).

According to Slater (2004), the grasshopper sparrow is found in a variety of open grassland types, but appears to be area sensitive, preferring grasslands greater than 20 acres in size. They may select larger patches to avoid predation associated with edge habitats. In South Dakota, they are primarily found in mixed-grass prairies. Within these grassland patches, they prefer grasslands of intermediate height and avoid habitats where vegetation is less than 4 inches. They require some areas of bare ground for foraging and some taller vegetation (tall grasses, forbs, or scattered shrubs) for singing perches (Slater 2004).

Panjabi (2005) found that in the Black Hills, grasshopper sparrows can be locally abundant in some prairies, especially where there is a greater proportion of tall grass. They occur widely in native mixed-grass prairies in the southern Black Hills, and locally further north in the central Black Hills. Panjabi (ibid.) found them in the highest density in mixed-grass prairie habitat.

The Forest’s vegetation database shows increased acres of Black Hills grassland cover-types since 1995. Projects across the Forest have been emphasizing meadow and grassland restoration through removal of pine encroachment. Some of this, particularly pine removal on the periphery

of prairies, is likely contributing to an increased habitat trend for the grasshopper sparrow. However, changes in mapping and reporting methods might contribute to at least some of the difference (USDA Forest Service 2007b).

Grasshopper sparrows have been monitored on the Black Hills since 2002 in cooperation with the RMBO (Panjabi 2003, 2005). The monitoring program was designed to statistically detect population trends over a longer time period than it has been implemented. However, a less rigorous analysis of the data suggests an upward Forestwide population trend between 2002 and 2004 (USDA Forest Service 2007b). However, this may not be a trend, but instead a short-term phenomenon. According to Panjabi (2003), it is possible that numbers would decrease in future years as habitat becomes more suitable again on the Great Plains (USDA Forest Service 2007b).

Lewis's Woodpecker

The Black Hills is at the eastern edge of the Lewis's woodpecker's range (Sibley 2000). In South Dakota, Lewis's woodpecker is considered a locally uncommon summer resident in the Black Hills and a locally rare yearlong resident of adjacent stream bottoms (South Dakota Ornithologist's Union 1991). Breeding has been documented in the Black Hills by Peterson (1995) and Vierling (2004). It is an uncommon summer resident in Wyoming, with breeding records in the east, north, and western portion of the state (Luce et al. 1999).

The Lewis's woodpecker is an edge specialist that prefers open mature pine forests, mature cottonwood forests, and areas with large burned trees (Tobalske 1997). Burned stands are used most often after they have aged several years (Tobalske 1997). A well-developed shrub layer is usually present (Anderson 2003). In the Black Hills, this woodpecker is most often observed in burned pine forests, but it could also be found in mature to late-successional ponderosa-pine stands that have an open canopy (structural stages 4A and some 5). Lewis's woodpeckers typically excavate nest cavities in soft ponderosa pine or cottonwood snags, although they would also re-use cavities made by other woodpecker species. Soft snags are dead trees in advanced stages of decay, and they have typically been dead longer than hard snags. Hard snags usually become soft snags given enough time.

Recent bird monitoring on the Black Hills has detected an average of 6 birds each year since 2001 (Giroir et al. 2007). Breeding Bird Survey data suggests that many populations of Lewis's woodpeckers may have declined since the 1960s (Sauer et al. 2001; Tobalske 1997). However, due to the sporadic distribution and cyclical abundance of this species, Breeding Bird Survey data may not adequately sample populations. Furthermore, many estimates lack statistical significance (Sauer et al. 2001).

Risks to Lewis's woodpeckers include activities that reduce open or old-growth ponderosa-pine forests and snags (e.g., fire suppression and clearcutting; Anderson 2003). Loss of cottonwood riparian habitat and human encroachment on breeding and wintering habitat are also negative factors (Tobalske 1997), although little cottonwood habitat exists on the Forest.

Loggerhead Shrike

The loggerhead shrike is a fairly common summer resident in Wyoming and South Dakota, with breeding records occurring over most of both states (Luce et al. 1999, Tallman et al. 2002, Peterson 1995). The bird is rare or casual (out of normal range) in the Black Hills (Tallman et al. 2002, South Dakota Ornithologist's Union 1991). Breeding records occur near the periphery of the Black Hills but not in the interior or at higher elevations (Peterson 1995). Breeding Bird Survey data between 1966 and 2000 indicate significant declines in loggerhead shrikes nearly

rangewide (Sauer et al. 2001). In South Dakota, a nonstatistically significant decline has been shown (Sauer et al. 2001). In Wyoming, populations appear to have increased 3.7 percent per year between 1980 and 2000 (Sauer et al. 2001). Regional population declines have been linked to shrub conversion for increased livestock forage, wildfires in arid shrublands, insect (particularly grasshopper) control programs, and grazing pressure that concentrates in arid shrub communities (Beidleman 2000). Wiggins (2005a) lists agricultural conversion, degradation or loss of nesting trees and shrubs, and over-grazing as potential threats to the species.

The loggerhead shrike is associated with open habitats that include scattered or clustered shrubs or trees. This includes some types of grasslands, shrublands, and savannas. Wiggins (2005a) describes nesting habitat as having trees, shrubs or low bushes and elevated perches for hunting and courtship activities. Foraging habitat includes areas of open, short vegetation with some bare areas and thorny trees or barbed-wire fence for impaling prey (Wiggins 2005a). These habitats are limited in the Black Hills but are provided mainly by mixed-grass prairies, mountain mahogany shrublands, and grassy or brushy areas with scattered juniper or ponderosa pine. The combination of habitat features described above is distributed primarily along the southern flank of the Black Hills, especially in the southwestern portion. Most of the interior Black Hills do not provide suitable habitat because tree density is too high.

Long Billed Curlew

Long-billed curlews are native prairie specialists, nesting primarily in shortgrass or mixed-grass prairie habitat with flat to rolling topography (Sedgwick 2006). They prefer short vegetation and generally avoid habitats with trees, abundant shrubs, and tall, dense grass (Sedgwick 2006). Curlews may use taller, denser grass during brood rearing when shade and camouflage from predators are presumably more important for chicks (Sedgwick 2006). Long-billed curlews have been observed nesting in suitable habitat on the Black Hills, mostly the southern Black Hills, during annual bird monitoring efforts. A marginally significant decline has been observed in South Dakota (Sedgwick 2006).

Mountain Plover

Mountain plovers have specific breeding habitat requirements, preferring flat, open areas with very shortgrass and scattered cactus (Graul 1975). Vegetation on shortgrass prairie sites is less than 4 inches tall, and nest sites in the shrub-steppe are usually on active prairie dog towns. Throughout their range, mountain plovers selectively nest on active prairie dog colonies, especially those of the black-tailed prairie dog (Dinsmore 2003).

Mountain plovers have been observed in the general vicinity of the Wyoming Black Hills, with nesting documented in the southern half and north central portion of Wyoming (Luce et al. 1999). Mountain plovers were formerly rare breeders in southwestern South Dakota, and they are currently classified as accidental in South Dakota (Tallman et al. 2002). There is one modern (1977) record of a mountain plover in Bennett County South Dakota (the south central portion of the state), and a few relatively recent, unconfirmed reports of the species (Tallman et al. 2002).

The current breeding distribution of mountain plovers does not include the Black Hills region (Dinsmore 2003). Disturbed and low-growing prairie grassland habitats suitable for mountain plover are currently rare within the Forest. There are only10 prairie dog colonies on 386 acres across the Black Hills National Forest (see p. 155), which limits their availability of nesting habitat.

Northern Goshawk

The northern goshawk is considered a common resident of coniferous forests in Wyoming (Luce et al. 1999). In South Dakota, this forest raptor is a rare to uncommon permanent resident, especially in the higher elevations of the Black Hills (South Dakota Ornithologist's Union 1991). Known nest densities are generally higher in the northern and central hills. Goshawks are difficult to monitor because of their secretive nature and use of alternate nests. Goshawk monitoring on the Forest consists of monitoring known nests for nesting activity. Goshawk nest activity has ranged from 20 to 40 percent of monitored nests being active in a given year (USDA Forest Service 2007b). Some territories monitored may have been active but were not confirmed, because goshawks are secretive and difficult to detect and often use alternate nests. Additional pairs likely occur on the Forest but have not been detected for the same reason. There is insufficient information to determine population trends in Region 2 or North America (Kennedy 2003).

Goshawks typically nest in relatively dense (dependent on forest type) forest areas and use a mosaic of structural stages for foraging within their home range (Kennedy 2003). Typical nest areas for goshawks in the northern Rocky Mountains are single storied, mature or late-successional coniferous forest, with high canopy closure, clear forest floors, on north-facing moderate slopes (Hayward and Escano 1989; Squires and Ruggiero 1996). Goshawks tend to select stands that have relatively large trees and relatively high canopy closure (Kennedy 2003). In the Black Hills, the goshawk nests in mature, dense, or moderately dense stands of large-diameter pine. Reynolds et al. (1992) characterized the nest area as mature and old stands with canopy closure greater than 50 percent. Ponderosa pine structural stages 4C and 5 (dense mature forest and late-successional) at least 30 acres in size likely best meet these conditions in the Black Hills. Structural stage 4B (mature forest with 40 to 70 percent canopy closure) may also provide some additional nesting habitat.

According to Reynolds et al. (1992), the post-fledging family area (approximately 420 acres) and the foraging area (approximately 5,400 acres) typically include a diversity of forest types and conditions including stands of young, mid-aged, mature, and late-successional trees. At least 40 percent of the home range is recommended to be comprised of mature or late-successional stands with greater than 40-to-50 percent canopy closure, which roughly equates to structural stages 4B, 4C, and 5 on the Black Hills. Snags, downed logs, and woody debris are an important component of the post-fledging family and foraging habitat. Downed logs and woody debris are also an important component of goshawk habitat.

Northern Harrier

The northern harrier is an uncommon migrant and summer resident in South Dakota (Tallman et al. 2002). Harriers are relatively absent from the Black Hills (Slater and Rock 2005), but the species is occasionally observed here.

Harriers are open-country hawks that are commonly found in prairies, wetlands, marshes, meadows, croplands, and shrublands (Slater and Rock 2005). Associated topography is generally flat. Most nest sites are in undisturbed wetlands or grasslands dominated by thick vegetation (Slater and Rock 2005).

Large open areas are limited on the Forest, which probably constitute the most limiting factor for harriers on the Forest. Currently, there are approximately 110,000 acres of grasslands on the Forest (USDA Forest Service 2007b), but much of this occurs in linear meadows or isolated

patches that are likely too small to support birds for a full season or more. The most extensive grasslands occur in the southern Black Hills.

Harriers have not yet been documented in shrublands of the Black Hills, but presumably, they could use at least some of this cover type. Shrublands occur on over 5,300 acres of the Forest (USDA Forest Service 2007b), mostly along the Wyoming-South Dakota boundary east of Newcastle.

Peregrine Falcon

The peregrine falcon has a worldwide distribution, and breeds on every continent but Antarctica (Terres 1991). In the United States, it occurs over much of the West and the eastern seaboard. However, because peregrines have very large territories, population densities are low throughout its range (Johnsgard 1990).

The peregrine falcon inhabits a wide variety of open habitats if cliffs are present (Terres 1991). Optimal cliffs are generally at least 200 to 300 feet high and dominate the surrounding landscape (Sharps and O'Brien 1985). Nest sites are typically on open ledges or shelves that are protected by cliff overhangs and tend to be on higher cliffs (Johnsgard 1990). Nest sites are generally considered the most limiting factor for the species and have a large influence on where the species occurs. Peregrines prefer to hunt in relatively open areas where they can maneuver to capture small and medium-sized birds (Terres 1991).

In the Black Hills, the peregrine falcon is an uncommon spring and rare fall migrant and a rare winter visitor (Tallman et al. 2002). Potential nest sites may occur in deep rocky canyons or other places with tall vertical cliffs (USDI Fish and Wildlife Service 1984). Historical records indicate nesting occurred in the Black Hills in the 1960s (ibid.). The peregrine has not been documented breeding in the Black Hills since that time despite efforts to reestablish it through cross-fostering and hacking during the late 1970s and late 1990s (USDA Forest Service 1979a, Sharps and O'Brien 1985, Tallman et al. 2002). Evaluation of potential peregrine habitat by the Peregrine Fund concluded that most of the Black Hills does not provide adequate nesting sites. The Monitoring Birds of the Black Hills program has not detected peregrines anywhere in the Black Hills since it began in 2001 (Giroir et al. 2007).

Open areas that could provide foraging habitat in the Black Hills include grasslands, shrublands, and structural stages with open canopies (1, 2, 3A, 4A). Currently, there are nearly 600,000 acres that meet these criteria on the Forest. The main factors that may limit occupation of the Black Hills by peregrines are the lack of tall, unbroken cliffs and isolation from established breeding populations.

Yellow-Billed Cuckoo

Yellow-billed cuckoos occur in riparian and other deciduous woodlands throughout the United States, except in the Northwest and northern Rocky Mountains (Wiggins 2005b). Although they are found throughout most of the West, cuckoos are not common there. In western South Dakota and eastern Wyoming, the species is a rare to uncommon breeder (ibid). The yellow-billed cuckoo is considered a riparian obligate species (Nicholoff 2003). Yellow-billed cuckoos prefer to nest in open woodlands with a dense understory and near water. They typically inhabit wooded river valleys in the Great Plains (Wiggins 2005b).

Breeding habitat in the Black Hills occurs mainly in low-elevation riparian areas. Habitat is very limited on the Forest and has most potential to occur where narrowleaf cottonwood or bur oak

riparian corridors meet the Forest boundary at the edge of the Black Hills. Breeding has been documented in the Bear Lodge Mountains and likely occurs elsewhere at lower elevations (Panjabi 2003). The site was a mature, bur-oak woodland that had a well-defined understory and very large-diameter trees (Panjabi 2003). Yellow-billed cuckoos are extremely sensitive to habitat alterations (Nicholoff 2003, Wiggins 2005b). Major causes of degradation have included grazing, placer mining, cultivation, road development, dam construction, channel realignments, urbanization, and loss of riparian habitat (Wiggins 2005b).

American Marten

The American marten is distributed over much of the western United States where it occurs in moist boreal forests (Buskirk 2002). The South Dakota Game, Fish, and Parks reintroduced a total of 125 individuals into the Black Hills during the 1980s and 1990s (Buskirk 2002). Fecske et al. (2003) recently estimated that 124 resident martens occur in high-quality habitat, with additional animals occurring at lower density within lower quality habitat. Although considerable mortality and reproduction have likely occurred here since reestablishment began, it appears the marten population trend is relatively stable in the Black Hills (USDA Forest Service 2004).

According to a recent marten study (Fecske et al. 2003), the greatest marten concentrations appear to be in the northern part of the Forest southwest of Deadwood (northern subpopulation) and in and around the Norbeck Wildlife Preserve (Norbeck subpopulation) (Fecske et al. 2003). These two dominant subpopulations are likely very important in maintaining species persistence in the Black Hills. The Black Hills supports an isolated population, with the nearest neighboring population in the Bighorn Mountains of Wyoming (Buskirk 2002).

Martens are primarily associated with mature white spruce in the Black Hills. Key habitat elements are relatively dense forests with complex physical structure near the ground, abundant coarse woody debris, and lengthy fire-return intervals (Buskirk 2002). Martens prefer moist coniferous forest types with tree species that have branches on their lower boles. White spruce is the tree species on the Forest that provides this condition. Approximately 25,000 acres of white-spruce stands currently occur on the Forest, mostly at high elevations, on north aspects, and in cool canyon bottoms. Fire suppression during the last century has allowed spruce to increase in abundance, density, and maturity in the Black Hills, usually at the expense of quaking aspen (Parrish et al. 1996).

American marten typically avoid dry ponderosa pine sites; however, due to the limited distribution of spruce in the Black Hills, most marten territories undoubtedly contain some portion of pine (Buskirk 2002). Mature and late-successional pine stands also help maintain connectivity between spruce stands. Martens are sensitive to habitat fragmentation and would not move through large, non-forested areas. Fecske et al. (2003) quantified high-quality marten habitat on the Forest based on a habitat relation model (Fecske et al. 2002). They estimated approximately 131,600 acres of high-quality marten habitat exist on the Forest. About 11 percent of this is in the spruce cover type. Approximately 91,000 acres of the high-quality marten habitat supports the two main subpopulation centers, of which about 14 percent is in spruce. Spruce makes up only about two percent of the forested acres Forestwide. This supports the literature that marten appear to use spruce disproportionately to its availability in the Black Hills.

Coarse woody debris is an important component of marten habitat. Large logs and other structures provide protection from predators, access to the subnivean (i.e., beneath the snow) space where most winter prey are captured, and protective thermal conditions, especially during

winter (Buskirk and Powell 1994). A variety of structures is used for dens, with trees, snags, logs, and rocks accounting for 70 percent of reported den structures (Buskirk and Ruggiero 1994).

Motorized recreation can cause increased deaths through vehicle collisions (Buskirk 2002). Increased numbers of forest users associated with dispersed recreational use could cause a wide range of negative effects on martens, including shooting, killing by dogs accompanying recreationists, or providing access to toxins (Buskirk 2002). Off-road vehicles are potentially important as they facilitate dispersed recreation, impeded vegetative recovery on abandoned roads, and compact snow, facilitating movements by competitors of martens (Buskirk 2002). Road-related mortality has been observed along highways and at least one mortality was observed along a primitive road.

Black-Tailed Prairie Dog

Historically, black-tailed prairie dogs were one of the most conspicuous and characteristic residents of the shortgrass and mixed-grass prairies of the United States (USDI Fish and Wildlife Service 2000). At present, the black-tailed prairie dog is found in remnant populations throughout much of its former range, and significant range contractions have occurred in the eastern portion of the species range, including South Dakota (ibid.).

Black-tailed prairie dogs are associated with shortgrass and mixed-grass prairies but require sites with soils conducive to burrowing. Suitable prairie dog habitat on the Black Hills National Forest is limited to non-rocky grassland soils on the Hell Canyon Ranger District. The Forest manages for 200 to 300 acres of prairie dog towns in at least three separate towns (Forest Plan Objective 237). There are currently 10 known prairie dog colonies on the Forest, covering approximately 386 acres of National Forest System land (USDA Forest Service 2006b). All the towns are in South Dakota. There are no prairie dog towns on the Wyoming portion of the Forest. The three largest towns are about 170, 110 and 40 acres in size. All other towns are less than 20 acres. Additional acres occur on adjacent private land. The potential for prairie dog expansion on the Forest is limited because prairie dog towns on the Forest quickly reach private land or encounter rocky soils that make burrowing difficult. Large areas (greater than 1,000 acres) of potentially suitable prairie dog habitat are not present on the Forest. The colonies are comparatively small and disjunct from adjacent known colonies. Prairie dog towns have remained stable or increased in size on the Forest regardless of recreational shooting and disease (USDA Forest Service 2006b).

Fringed Myotis

The Black Hills population of the fringed myotis is a disjunct population and recognized as belonging to a distinct subspecies, *Myotis thysanodes pahasapensis*. The South Dakota Natural Heritage Program gives the fringed myotis a state ranking of imperiled (S2) and the Wyoming Game and Fish Department considers it a species of special concern (Schmidt 2003a). In the Black Hills, this species is known in Custer, Fall River, Lawrence, and Pennington counties of South Dakota, and Crook and Weston Counties in Wyoming at an elevation between 3,800 and 6,200 feet (ibid.). The fringed myotis is a year-round resident of the Black Hills. It can be found during the summer but is very difficult to locate during the winter (USDA Forest Service 2000b).

The fringed myotis occupies a variety of habitats including mid-elevation desert, grass, and woodland habitats and is found at higher elevations in spruce-fir and in mixed timber (Schmidt 2003a). In the Black Hills of South Dakota, it is one of the more commonly captured bats during summer mist-netting studies and tends to occur along ecotones between ponderosa pine and

oak/juniper forests (Schmidt 2003a). Little is known about hibernacula requirements for this species. The fringed myotis is known to hibernate in the "Heavenly Room" of Jewel Cave. It tends to hibernate in small groups in the head-up position and to isolate itself from other species. Snags, caves, mines, and buildings may be used as roosts (Schmidt 2003a). In the Black Hills, maternity roosts recorded for this species include rock crevices and ponderosa-pine snags (Cryan et al. 2001).

Riparian areas and water sources are important features of habitat. Open water is important because bats obtain water while flying. Riparian habitats are important for insect production and provide foraging opportunities (USDA Forest Service 2000b).

The fringed myotis is more closely associated with the forested environment than other bat species and may be fairly sensitive to forest management, particularly the availability of snags as roost sites (USDA Forest Service 2000b). The fringed myotis has been documented using ponderosa pine snags for roosts in the Black Hills (Cryan et al. 2001) and in other regions (Rabe et al. 1998).

Human disturbance in or near bat roost sites and hibernacula may cause site abandonment and local population losses. Off-highway vehicles that create substantial noise may disturb reproductive females during the critical pre-parturition period (Schmidt 2003a). Motorized routes may provide access to caves and rock climbing areas, which could lead to disturbance as well. Activities that reduce the availability of suitable roost snags can negatively impact these bats. Activities in riparian zones that reduces available surface water or reduces mesic vegetation may impact site suitability and prey distribution or abundance for bats.

Townsend's Big-Eared Bat

Townsend's big-eared bat is considered a species of concern through much of its range in the western United States. This species is a year-round resident in all South Dakota Black Hills counties and reported to be the most numerous bat species in Crook County, Wyoming (Schmidt 2003b). In 1992, it was reported that there were 1,200 Townsend's big-eared bats hibernating in Jewel Cave, making it the largest known hibernating colony of this species in the western United States (Schmidt 2003b). There are four known maternity roosts of these bats in the Black Hills, two of which are on the Forest (USDA Forest Service 2000a).

Townsend's big-eared bats occupy a variety of habitats but are closely associated with caves and mines (Schmidt 2003b). They also use riparian areas for foraging, including wetlands and meadows (Pierson et al. 1999). Riparian areas account for approximately one percent of public and private land in the Black Hills and are typically located adjacent to streams and around natural springs, seeps, fens, and reservoirs. Townsend's big-eared bats feed primarily on moths, whose life cycles are dependent upon native forest plants (Schmidt 2003b).

Key habitat components include suitable maternity roost sites and hibernacula. These bats utilize both caves and mines for hibernacula (Schmidt 2003b). In the Black Hills, maternity roost sites are often in steep drainages with nearly vertical walls. These bats also utilize caves with relatively warm domes or large flat ceilings (Schmidt 2003b).

This species is very sensitive to activities such as recreational caving and mine closings, especially at hibernacula and maternity roosts (Schmidt 2003b). Townsend's big-eared bats are especially susceptible to human disturbance during the active time of year (summer), more so than other bat species (USDA Forest Service 2000b). These bats are extremely sensitive to

disturbances in the vicinity of their roosts, including loud noises such as those produced by motorized off-road vehicles, discharging of firearms, and other such activities (Schmidt 2003b).

Rocky Mountain Bighorn Sheep

The range of Rocky Mountain bighorn sheep includes southern British Columbia and southwest Alberta south to southeast California, Arizona, and New Mexico (Whitaker 1980). Current estimate of the population in the Black Hills is approximately 350 sheep (Huxoll 2007).

There are two main populations of bighorn sheep in the Black Hills. The Custer State Park herd is located in Custer State Park and consists of three subherds. The Custer State Park herd experienced a recent die-off from disease. The Rapid City herd is located primarily on National Forest System land and consists of three subherds: the Sheridan Lake, Dark Canyon, and Spring Creek subherds. The Rapid City herd is located between Hill City, Pactola Reservoir, and Rapid City (Merwin 2000). There is also a herd in Elk Mountain area in the southern Black Hills.

Rocky Mountain bighorn sheep typically inhabit alpine meadows, foothills, cliffs, and rock outcrops (Luce et al. 1999; Clark and Stromberg 1987). Alpine habitat is absent in the Black Hills. Merwin (2000) noted that bighorn sheep often selected areas with good visibility (less than 40 percent canopy closure) within suitable distance of water and escape terrain. Limits to persistence include limited availability of habitat on the Forest, vulnerability of habitat to residential development on adjacent private lands, and disturbance from recreation (Benzon and Halseth 1999). Disease is a major concern as diseases transferred from domestic sheep can cause major herd reductions.

Species of Local Concern

Species of local concern are plant, fish and wildlife species (including subspecies or varieties) that do not meet the criteria for sensitive status. These could include species with declining trends in only a portion of Region 2, or those that are important components of diversity in a local area. The local area is defined as National Forest System lands within the Forest (FSM 2620.5 Black Hills Supplement 2600-2005-1). All species of local concern on the Forest are addressed in this section except bighorn sheep (Table 34). Bighorn sheep have been recently added to the Region 2 sensitive species list and are addressed under Sensitive Species and in the biological evaluation.

Demand Species

Species that are important local game animals but are not MIS, species of local concern or sensitive species are demand species. These species are of particular interest to the public because they are hunted. This analysis includes three demand species: elk, mule deer, and turkey. Elk use a wide variety of vegetation types on the Forest but show a preference for forested riparian areas, forested stringers in meadows, and deciduous stands of birch or aspen (SAIC 2003). Elk find cover (thermal or hiding or both) on the Forest in the denser stands of conifers (summer and winter) and hardwoods (summer only). For forage, however, they rely on more open stands and meadows and prairies, all of which may provide an abundance of grasses, forbs, and/or shrubs (SAIC 2003).

Table 34. Black Hills species of local concern

Species	Habitat
American Dipper (*Cinclus mexicanus*)	Clear, fast-flowing streams. In the Black Hills, occurs in Spearfish Creek and several tributaries. Also has been found at Rapid Creek and some of the streams between Rapid Creek and Spearfish Creek. Spearfish Creek is considered to be the only creek left in the Black Hills capable of supporting a self-sustaining population of dippers
Black-and-White Warbler (*Mniotilta varia*)	Found in mature and second-growth deciduous and mixed-deciduous-coniferous forests. They are found mostly in bur oak woodlands and associated edges
Broad-winged Hawk (*Buteo platypterus*)	Forage in mature to old-growth forests, along forest streams, roads, and openings. In the Black Hills, nests primarily in ponderosa pine in mixed pine-and-deciduous habitats, occasionally with a white-spruce component.
Cooper's Hawk (Accipiter *cooperii*)	Considered a habitat generalist. Known to nest in riparian, ponderosa pine, and hardwood forests.
Northern Saw-Whet Owl (*Aegolius acadicus*)	Highest densities tend to be found in coniferous forests. Nests in snags in cavities excavated by flickers and other large woodpeckers.
Pygmy Nuthatch (*Sitta pygmaea*)	A primary cavity nester that also uses secondary cavities. Prefer old or mature undisturbed forests, but are also known to use open, park-like stands of ponderosa pine. Likely needs heterogeneous forests with a mixture of well spaced old trees and trees of intermediate age
Sharp-shinned Hawk (*Accipiter striatus*)	Nest almost exclusively in conifers. Vegetation at nest sites is usually in the early successional stages and extremely dense. White spruce could serve as important nesting habitat.
Bats (*Myotis evotis, Myotis volans, Myotis septentrionalis, Myotis ciliolabrum*)	Found in the wooded riparian zone in badlands and prairies to higher elevation coniferous and deciduous woodlands. Hibernacula include caves and mines. Day roosts have been reported in buildings; under shingles; behind shutters of buildings; underneath exfoliating tree bark; inside cavities or crevices of trees; and in caves, mines, and quarries. Uses ponderosa pine snags as summer/maternity roosts.
Meadow Jumping Mouse (*Zapus hudsonius campestris*)	Strongly associated with riparian habitats along small streams in meadows and habitats beneath forests with an understory of deciduous shrubs, grasses, forbs, and fallen logs and is presumed to disperse primarily along stream corridors.
Mountain Goat (*Oreamnos americanus*)	Inhabits rugged terrain including cliffs, rock faces, ledges, and talus slopes. Primary range and habitat of the mountain goat in the Black Hills is centered around Harney Peak and The Needles. The mountain goat population occurs largely within the Black Elk Wilderness and the Norbeck Wildlife Preserve.
Northern Flying Squirrel (*Glaucomys sabrinus*)	Habitat typically dominated by conifers or mixed coniferous/deciduous forests. Found in white-spruce forests in moist canyons of the northern Black Hills. Ponderosa pine is important foraging habitat in the Black Hills especially areas with larger trees and more canopy cover.
Butterflies Atlantis Fritillary (*Speyeria atlantis pahasapa*) Tawny Crescent (*Phycoides batesii*)	Atlantis fritillary found in wet meadows and moist canyons. Tawny crescent is found in open meadows, stream bottoms, roads, trails, and riparian woodlands.
Snails (*Vertigo arthuri, Catinella gelida, Vertigo paradoxa, Discus shimekii*)	Use a variety of habitats: white spruce, hardwoods, mountain mahogany, and ponderosa pine.

Mule deer tend to inhabit more open, rugged habitat and are more abundant in the southern Black Hills of South Dakota and Wyoming, where open, rocky habitat is more prevalent (Seig and Severson 1996). Meadows and other grass cover types provide forage. Mountain mahogany habitat in the southern Black Hills may play an important role in providing mule deer habitat.

Turkeys occur in a wide variety of vegetation types, including foothill and montane riparian associations, pine-juniper shrubland, mixed-grass prairie, and ponderosa pine, white spruce, and aspen forest stands (Panjabi 2003). Open areas are important for foraging during the summer, though meadows are seldom selected for (Rumble and Anderson 1996). Dense mature ponderosa pine serves as winter cover and a source of mast (Rumble and Anderson 1996). During the winter, turkeys also prefer south-facing slopes where the sun melts the snow (Rumble and Anderson 1996).

Migratory Birds

Many species of migratory birds are of international concern due to naturally small ranges, loss of habitat, observed population declines, and other factors. The Forest recognizes the ecological and economic importance of birds and approaches bird conservation at several levels by implementing Forest Plan objectives, standards, and guidelines; a Forestwide bird-monitoring program; and site-specific mitigation and effects analyses for identified species of concern.

Forest Plan objectives describe desired resource conditions. The most relevant objectives for bird conservation are those relating to vegetation diversity, landscape structural diversity, snags and down woody material, riparian condition, habitat improvements, and disturbance processes. Standards and guidelines are designed to help achieve those objectives and are implemented at the project level. The most relevant standards and guidelines for migratory birds that occur on the Forest are presented in discussions of individual birds in the Species of Local Concern and Management Indicator Species sections of this document and the Threatened and Endangered Species and Region 2 Sensitive Species sections of the biological assessment and biological evaluation.

Bird monitoring is conducted at the Forest level to determine species distribution, abundance, and trends (Panjabi 2001, 2003, 2004, 2005, Beason et al. 2006, Hutton et al. 2007, Giroir et al. 2007). The RMBO designs and conducts the monitoring to provide statistically rigorous population trend data for at least 61 species that breed in the Black Hills. Trend data would assist the Forest in determining whether additional conservation measures are necessary. Species of concern applicable to project-level conservation are identified by many sources including the Endangered Species Act; the Region 2 sensitive species list; the Forest MIS list; the U.S. Fish and Wildlife Service's Birds of Conservation Concern (BCC) publication (USDI Fish and Wildlife Service 2002); and the Wyoming Partners in Flight (PIF) Plan (Nicholoff 2003). All of these sources and their respective species of concern except the BCC and Wyoming PIF have been examined elsewhere in this document. The BCC 2002 publication partitions North America into 37 bird conservation regions (BCRs). The Black Hills is included in BCR 17 – Badlands and Prairies. The Wyoming PIF plan identifies three levels of priority birds, with the top level (Level 1) representing species that need conservation action. Table 35 shows the disposition of migratory birds from the U.S. Fish and Wildlife Service BCR-17 list of Birds of Conservation Concern and the Level 1 species list of the Wyoming PIF Plan.

Table 35. Species of conservation concern and Wyoming PIF priority 1 species

Species	List	Disposition
American Bittern	WY PIF	No Habitat on Forest
Trumpeter Swan	WY PIF	No Habitat on Forest
Bald Eagle	WY PIF	Region 2 Sensitive Species – Addressed in BE
Golden Eagle	BCR 17	Foraging habitat present. Evaluated below.
Northern Goshawk	WY PIF	Region 2 Sensitive Species – Addressed in BE
Swainson's Hawk	WY PIF	Occasional on Forest, evaluated below
Ferruginous Hawk	BCR 17, WY PIF	Region 2 Sensitive Species, - Addressed in BE (shrub-steppe/prairie)
Prairie Falcon	BCR 17	Nesting habitat present. Evaluated below.
Peregrine Falcon	BCR 17, WY PIF	Region 2 Sensitive Species – Addressed in BE
Greater Sage Grouse	WY PIF	No occurrence on Forest, Minimal sage brush (40 acres) on Forest in small patches.
Columbian Sharp-tailed Grouse	WY PIF	No habitat on Forest
American Golden-Plover	BCR 17	No habitat on Forest (prairie)
Mountain Plover	BCR 17, WY PIF	Region 2 Sensitive Species – Addressed in BE (shortgrass prairie)
Upland Sandpiper	BCR 17, WY PIF	Occurs on and adjacent to the Forest (grassland). Evaluated below.
Long-billed Curlew	BCR 17, WY PIF	Known occurrences. Discussed in BE.
Marbled Godwit	BCR 17	No habitat on Forest (prairies and prairie wetlands)
Sanderling	BCR 17	No habitat on Forest (prairie wetlands)
Wilson's Phalarope	BCR 17, WY PIF	No habitat on Forest (prairie wetlands)
Black-billed Cuckoo	BCR 17	Species present on Forest (riparian hardwood habitat). Evaluated below
Burrowing Owl	BCR 17, WY PIF	Region 2 Sensitive Species – Addressed in BE
Short-eared Owl	BCR 17, WY PIF	No habitat on Forest (shortgrass prairie)
Red-naped Sapsucker	BCR 17	Nesting habitat present. Evaluated below
Lewis' Woodpecker	BCR 17	Region 2 Sensitive Species – Addressed in BE
Franklin's Gull	WY PIF	No habitat on Forest
Forster's Tern	WY PIF	No habitat on Forest
Black Tern	WY PIF	No habitat on Forest
Dickcissel	BCR 17	Species present on Forest (prairie habitat). Evaluated below.
Grasshopper Sparrow	BCR 17	Region 2 Sensitive Species – Addressed in BE
Sage sparrow	WY PIF	No Habitat on Forest
Sprague's Pipit	BCR 17	No habitat on Forest (prairie)
Brewer's Sparrow	BCR 17, WY PIF	No habitat on Forest (shrub-steppe)
Baird's Sparrow	BCR 17, WY PIF	No habitat on Forest (shortgrass prairie)
Le Conte's Sparrow	BCR 17	No habitat on Forest (prairie wetlands)
McCown's Longspur	BCR 17, WY PIF	No habitat on Forest (shortgrass prairie)
Chestnut-collared Longspur	BCR 17	No habitat on Forest (prairie)

Environmental Consequences

Direct Effects and Indirect Effects

General Effects to Wildlife and Habitat Components

Direct mortality from wildlife/vehicle collisions could occur in all alternatives. In all alternatives, direct mortality is expected to affect individuals and is not expected to put populations at risk because collisions are less likely to occur on primitive roads and trails such as those designated in this project (Oxley et al. 1973). In general, the more motorized routes and motorized use in wildlife habitat, the more potential there is for wildlife/vehicle collisions.

The most effects on wildlife from motorized recreation are likely to come in the form of disturbance as a result of route or area use. The miles of motorized routes and the amount of area open to motorized cross-country travel is used to evaluate the level of effects to wildlife in general.

Alternative A

Alternative A is expected to have the most risk of direct mortality because it has the most area open to motorized cross-country travel. Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect habitat through trampling and dust creation. Disturbance would continue occur in areas where motorized cross-country travel is allowed (about 865,000 acres of the Forest).

Under Alternative A, disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and incrementally impact wildlife and wildlife habitat in general. Also, under Alternative A, new unintended roads and trails would continue the spread of invasive weeds and potentially increase it, neither of which moves us closer to the goals and objectives of the Forest Plan. Alternative A allows game retrieval on the most acreage. Alternative A also allows for motorized retrieval of all game, which could result in impacts from more hunters. Alternative A has the most acreage open to motorized dispersed camping which would provide additional impacts to wildlife.

Effects Common to All Action Alternatives

All the action alternatives are expected to have less chance of direct mortality than Alternative A because they have less area open to cross-country travel. Of the action alternatives, Alternative C is expected to have the most effects from direct mortality followed by Alternatives B, E and D, respectively, based on the miles of routes open to motorized travel.

Loss of habitat to road surface is expected to be minimal in all action alternatives. Little new construction is planned as part of this project. Little route obliteration is planned for existing routes that are closed under the alternatives. New designated routes are mostly 50 inches or less in width that existed previously but hadn’t been formally designated. Habitat fragmentation is expected to be minimal for the same reasons.

The action alternatives would not allow unrestricted motorized cross-country travel. These alternatives would have a net beneficial affect from closing much of the Forest to motorized cross-country travel. Disturbance from cross-country travel would be reduced and there would be a beneficial effect of reducing invasive weed spread and disturbance that creates seedbeds for invasive species.

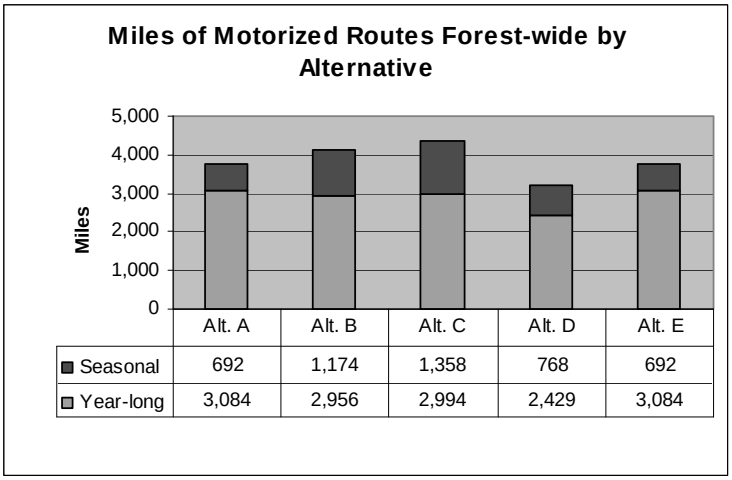

Figure 16. Miles of seasonal and year-long motorized routes by alternative on the Black Hills National Forest

Alternative C would have the most miles of motorized routes that could disturb wildlife, followed by Alternatives B, A, E, and D, respectively (Figure 16). The increase in routes in Alternatives B and C would likely offset some of the benefits of closing areas to motorized cross-country travel. Still, the net result would be a benefit due to the amount of area closed to cross-country travel. The miles of routes in Alternative E would remain at the existing level. The lack of cross-country travel in Alternative E is expected to result in a net reduction in disturbance. Alternative D would have the least disturbance to wildlife in general because it has the least miles of motorized routes and the least area open to cross-country travel.

Road and trail use also causes dust, which can affect wildlife. Effects from dust are expected to be correlated with the miles of routes as discussed above.

Motorized game retrieval can affect wildlife through disturbance. The effects of motorized game retrieval are expected to be minor. Most motorized game retrieval involves big game, which occurs in the fall outside the bird breeding season. Most big game animals are already being disturbed by hunters in the woods. Still, there could be some impacts to less mobile species.

Of the action alternatives, Alterative C would allow motorized game retrieval on the most acres followed by Alternatives B, D, and E respectively (Figure 17). Alternative B would reduce impacts from existing conditions because it only allows game retrieval for elk, which has far fewer hunters that would need to retrieve game, and in a reduced area. Alternative C would reduce impacts from existing conditions because it has less acreage open to motorized game retrieval, but may have more impacts than Alternative B in the retrieval area because it allows retrieval of elk and deer. Alternatives D and E would have the least

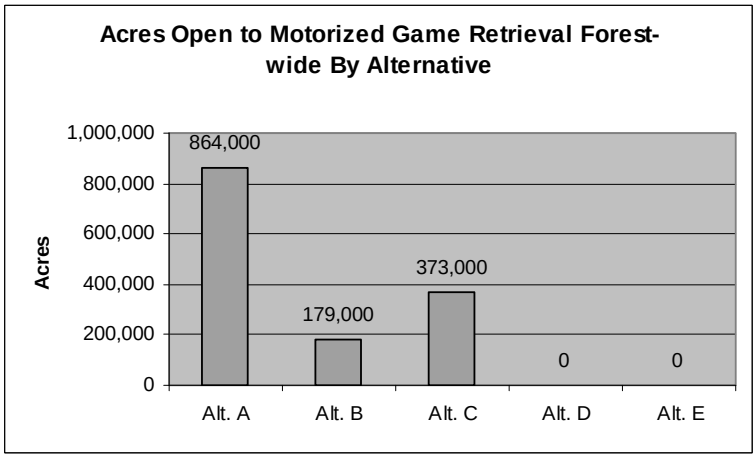

Figure 17. Acres open to motorized game retrieval by alternative on the Black Hills National Forest

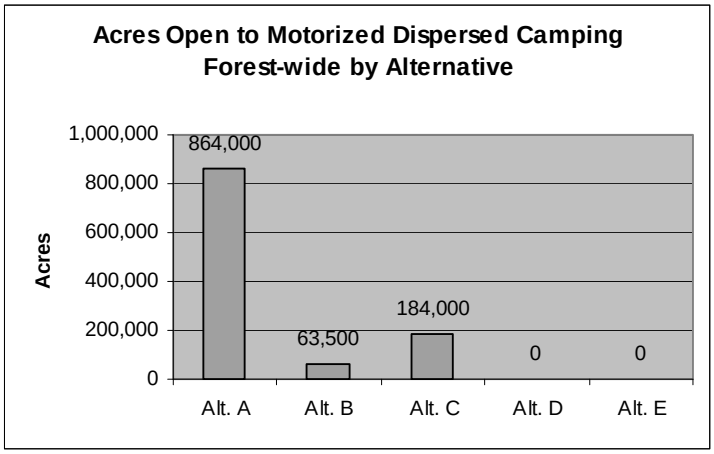

Figure 18. Acres open to motorized dispersed camping by alternative on the Black Hills National Forest

impacts from game retrieval because motorized game retrieval is not allowed.

Motorized dispersed camping can also disturb some wildlife. The effects of motorized dispersed camping are estimated using the acreage open to motorized-dispersed camping (Figure 18). Of the action alternatives, Alternative C has the most acreage open to motorized dispersed camping, followed by Alternatives B, D, and E, respectively.

Overall, the action alternatives would have a net benefit to wildlife due to the closing of areas to motorized cross-country travel. Alternative D would have the most benefit because it has the fewest motorized routes and the least area open to motorized cross-country travel, followed by Alternative E, B, and C, respectively.

Ponderosa Pine Habitat

Alternative A

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect understory vegetation and habitat loss. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and impact wildlife that use ponderosa pine habitat.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance to wildlife that use ponderosa pine is based on the miles of motorized routes in ponderosa pine and the acres of ponderosa

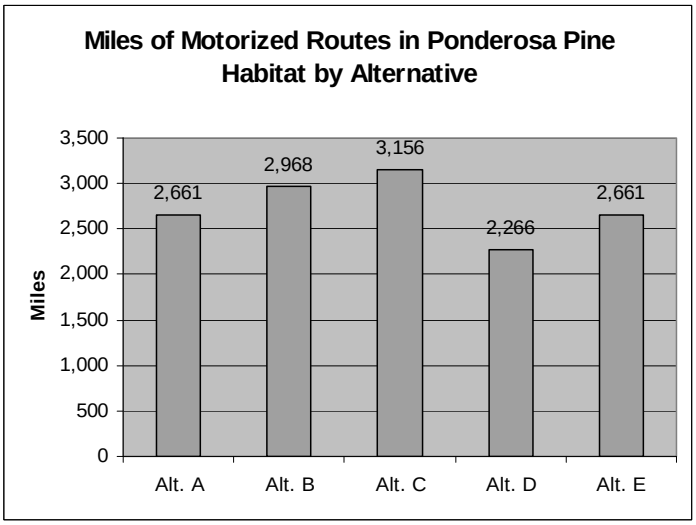

Figure 19. Miles of motorized routes in ponderosa pine habitat by alternative on the Black Hills National Forest

pine open to motorized cross-country travel. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on wildlife using ponderosa pine habitat by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in ponderosa pine habitat, followed by Alternatives B, A, E and D, respectively. Still, the action alternatives would have a net positive effect on wildlife using ponderosa pine habitat due to the amount of habitat closed to motorized cross-country travel.

The effects of motorized game retrieval and dispersed camping in ponderosa pine habitat are expected to be similar to those discussed above for the Forest in general.

White Spruce Habitat

Alternative A

Unrestricted motorized cross-country travel would continue in this alternative in much of the spruce habitat. This could lead to more user-created routes that could further affect understory vegetation. The effects of disturbance to wildlife that use spruce habitat is based on the miles of motorized routes in spruce and the acres of spruce open to motorized cross-country travel.

Disturbance would continue to occur in areas where unrestricted motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation levels increase. User-created routes would continue to be created and impact wildlife that use spruce habitat.

The effects of motorized game retrieval and dispersed camping on spruce habitat are expected to be similar to those discussed above for the Forest in general.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

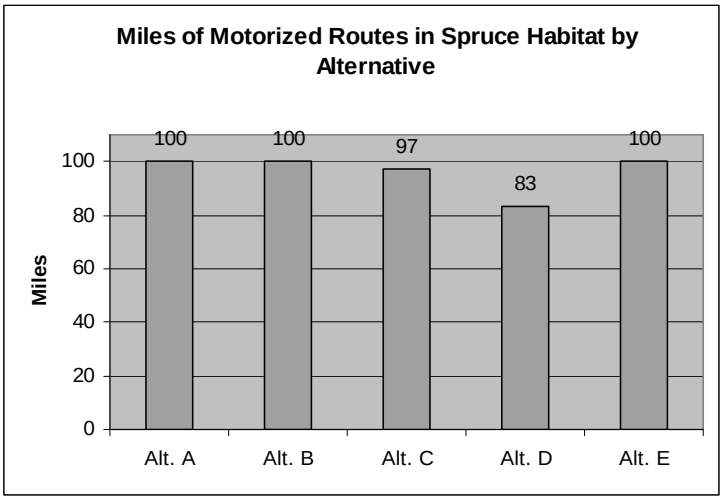

Figure 20. Miles of motorized routes in spruce habitat by alternative on the Black Hills National Forest

The effects of disturbance to wildlife that use spruce habitat is based on the miles of motorized routes in spruce and the acres of spruce open to motorized cross-country travel. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on wildlife using spruce habitat by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternatives A, B and E have the most motorized routes in spruce habitat, followed by Alternatives C and D, respectively. Still, the action alternatives would have a net positive effect on wildlife using spruce habitat due to the amount of habitat closed to unrestricted motorized cross-country travel.

The effects of motorized game retrieval and dispersed camping on spruce habitat are expected to be similar to those discussed above for the Forest in general.

Hardwood Habitat

Alternative A

Unrestricted motorized cross-country travel would continue in this alternative. This could lead to more user-created routes that could further affect understory vegetation. The effects of motorized game retrieval and dispersed camping on hardwood habitat are expected to be similar to those discussed above for the Forest in general.

The effects of disturbance to wildlife that use hardwood habitat is based on the miles of motorized routes in hardwoods and the acres of hardwoods open to motorized cross-country travel. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation levels increase. User-created routes would continue to be created and would impact wildlife that use hardwood habitat.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance to wildlife that use hardwood habitat is based on the miles of motorized routes in hardwoods and the acres of hardwoods open to motorized cross-country travel. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on wildlife using hardwood habitat by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in hardwood habitat, followed by Alternatives B, A, E, and D, respectively. Still, the action alternatives would have a net positive effect on wildlife using hardwood habitat due to the amount of habitat closed to motorized cross-country travel.

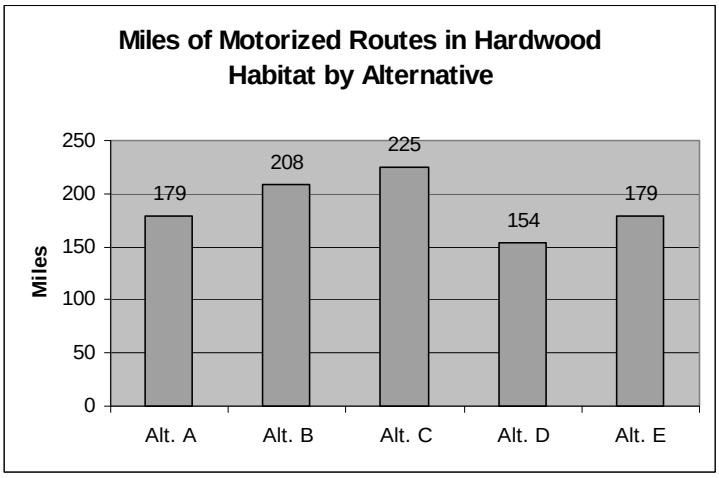

Figure 21. Miles of motorized routes in hardwood habitat by alternative on the Black Hills National Forest

Snag Habitat

Alternative A

Snag removal through firewood gathering or other means would remain consistent with current conditions. Some illegal snag cutting would likely occur. Alternative A is the only alternative that would allow unrestricted cross-country motorized travel, which could lead to more illegal snag cutting.

Effects Common to All Action Alternatives

Impacts to snag habitat is expected to be minimal and consistent with the Forest Plan (Standards 2301, 2305) for all action alternatives. None of the action alternatives would authorize the cutting or removing of snags. Some illegal snag cutting may occur under all action alternatives. Alternatives B, C, D, and E are expected to have less risk of illegal snag cutting due to less area open to unrestricted motorized cross-country travel.

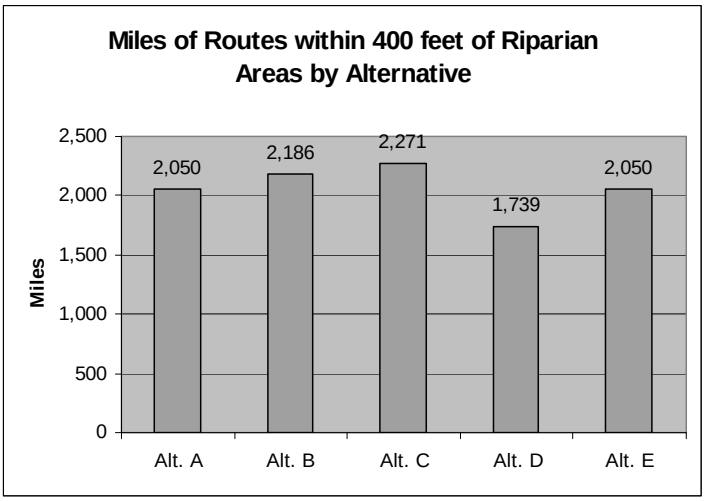

Figure 22. Miles of routes within 400 feet of riparian habitat by alternative

Riparian Habitat

Alternative A

Unrestricted motorized cross-country travel would continue in this alternative. This could lead to more user-created routes that could further affect riparian vegetation. The effects of motorized game retrieval and dispersed camping on riparian habitat are expected to be similar to those discussed above for the Forest in general.

Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and impact wildlife that use riparian habitat.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal. The effects of motorized game retrieval and dispersed camping on riparian habitat are expected to be similar to those discussed above for the Forest in general.

The effects of disturbance to wildlife that use riparian habitat is based on the miles of motorized routes in riparian habitat and the acres of riparian habitat open to motorized cross-country travel. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on wildlife using riparian habitat by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in riparian habitat, followed by Alternatives B, A, E, and D, respectively. Still, the action alternatives would have a net positive effect on wildlife using riparian habitat due to the amount of habitat closed to motorized cross-country travel.

Effects to the riparian habitat and associated species are mitigated through a wide variety of standards and guidelines, watershed conservation practices, and State BMPs that protect riparian areas. Forestwide standards and guidelines protect riparian areas, water influence zones, and wetlands. Long-term riparian ecosystem health and ecological function are provided for by not allowing actions that would be detrimental to riparian-ecosystem condition (Standards 1301, 1302). Objective 105 strives to prohibit motorized vehicles in wetlands, wet meadows, and riparian areas. Standard 1113 provides direction pertaining to minimizing sediment discharge into streams, lakes, and wetlands during road construction and other site disturbances. Guideline 9107 prohibits land vehicles from entering perennial steams where resource damage would occur. Guideline 9108 restricts vehicle traffic to roads and trails in riparian areas.

Grassland Habitat

Alternative A

Unrestricted motorized cross-country travel would continue in this alternative. This could lead to more user-created routes that could further affect understory vegetation. The effects of motorized game retrieval and dispersed camping on hardwood habitat are expected to be similar to those discussed above for the Forest in general.

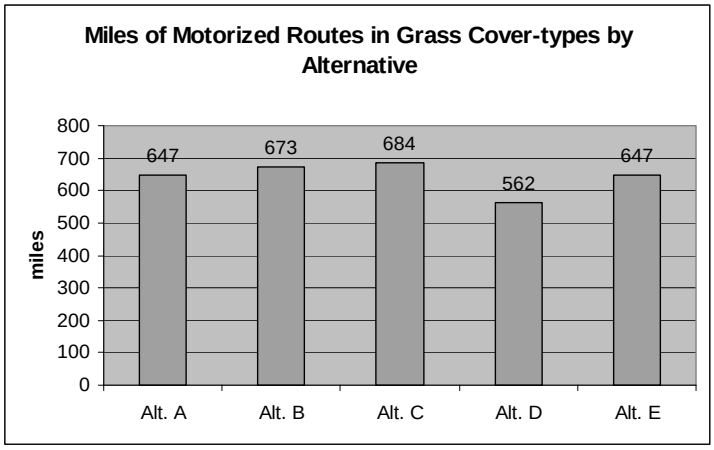

Figure 23. Miles of motorized routes in grassland cover types by alternative

The effects of disturbance to wildlife that use grassland habitat is based on the miles of motorized routes in grass cover-type and the acres of grass covertype open to motorized cross-country travel. Alternative A would continue to allow 647 miles of routes in grassland covertype, which would continue to disturb grassland species. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and would impact wildlife that use grassland habitat.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of motorized game retrieval and dispersed camping on grassland habitat are expected to be similar to those discussed above for the Forest in general. The effects of disturbance to

wildlife that use grassland habitat is based on the miles of motorized routes in grass covertype and the acres of grass covertype open to motorized cross-country travel. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on wildlife using grassland habitat by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in grassland habitat, followed by Alternatives B, A, E, and D, respectively. Still, the action alternatives would have a net positive effect on wildlife using grassland habitat due to the amount of habitat closed to motorized cross-country travel.

Shrubland (Mountain Mahogany) Habitat

Alternative A

Unrestricted motorized cross-country travel would continue in this alternative. This could lead to more user-created routes that could further affect vegetation in mountain mahogany habitat. The effects of motorized game retrieval and dispersed camping on mountain mahogany habitat are expected to be similar to those discussed above for the Forest in general.

The effects of disturbance to wildlife that use mountain mahogany habitat is based on the miles of motorized routes in mountain mahogany and the acres of mountain mahogany open to motorized cross-country travel. Alternative A would continue to allow 5 miles of routes in mountain mahogany habitat, which could disturb species using the habitat. Alternative A would also continue to allow unrestricted motorized cross-country travel in much of the mountain mahogany habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and would impact wildlife that use mountain mahogany habitat.

Effects Common to All Action Alternatives

Loss of mountain mahogany habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn’t been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of motorized game retrieval and dispersed camping on mountain mahogany habitat are expected to be similar to those discussed above for the Forest in general. The effects of disturbance to wildlife that use mountain mahogany habitat is based on the miles of motorized routes in mountain mahogany and the acres of mountain mahogany open to motorized cross-country travel. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on wildlife using mountain mahogany habitat by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. All alternatives have the roughly same amount of motorized routes in mountain mahogany habitat (about 5 miles). The action alternatives would have a net positive effect on wildlife using mountain mahogany habitat due to the amount of habitat closed to motorized cross-country travel.

Management Indicator Species

Black-backed Woodpecker

The black-backed woodpecker is also a Region 2 sensitive species. The effects to this species are discussed in detail in the biological evaluation. A summary of effects to all sensitive species analyzed is located below on page 193.

Brown Creeper

Alternative A

Habitat availability would remain the same as existing conditions in Alternative A. Effects on snags are expected to be minimal. The risk of illegal snag removal would be highest in Alternative A because it would allow the most area open to motorized cross-country travel. Brown creeper habitat condition and availability would be expected to remain stable on the Forest. Habitat fragmentation would remain at existing conditions because no new routes would be authorized.

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of brown creepers, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Game retrieval would have minimal effects on brown creepers. Most game retrieval would occur outside the brown creeper nesting season. Spring and summer dispersed camping could disturb nesting brown creepers. Effects from dispersed camping are expected to be similar to general effects to wildlife discussed above.

The effects of disturbance are estimated using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. White spruce and ponderosa pine structural stages 4C and 5 offer the best habitat for brown creepers. Alternative A would also continue to allow unrestricted motorized cross-country travel in much of this habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and impact brown creepers. Alternative A would continue to allow 332 miles of motorized routes in primary brown creeper habitat, which could disturb nesting brown creepers.

Alternative A is not expected to reduce the Forestwide population. Forestwide populations are expected to remain stable or increase.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of brown creepers, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn’t been formally designated. Brown creepers mostly forage in the forest canopy and would have few changes from routes on the ground. Effects on habitat condition and trend are expected to be minimal.

Impacts to snag habitat is expected to be minimal for all action alternatives. None of the alternatives would authorize the cutting or removing of snags. Some illegal snag cutting may occur under all alternatives. Alternatives B, C, D, and E are expected to have less risk of illegal snag cutting due to less area open to unrestricted motorized cross-country travel.

Roads can cause habitat fragmentation for species that tend to use the interior parts of forest patches. More roads tend to reduce the patch size and increase the ratio of edge-to interior area. This reduces the amount of habitat available to species that prefer these interior forest conditions, such as brown Creepers (Reed et al. 1996). Fragmentation of habitat is expected to be minimal in all action alternatives. Based on the above analysis, brown creeper habitat condition and availability is expected to remain stable on the Forest. All action alternatives contribute to conservation and maintenance of brown creeper habitat (Forest Plan Objective 238).

Game retrieval would have minimal effects on brown creepers for all action alternatives. Most game retrieval would occur outside the brown creeper nesting season. Spring and summer dispersed camping could disturb nesting brown creepers. Effects from dispersed camping are expected to be similar to general effects to wildlife discussed above.

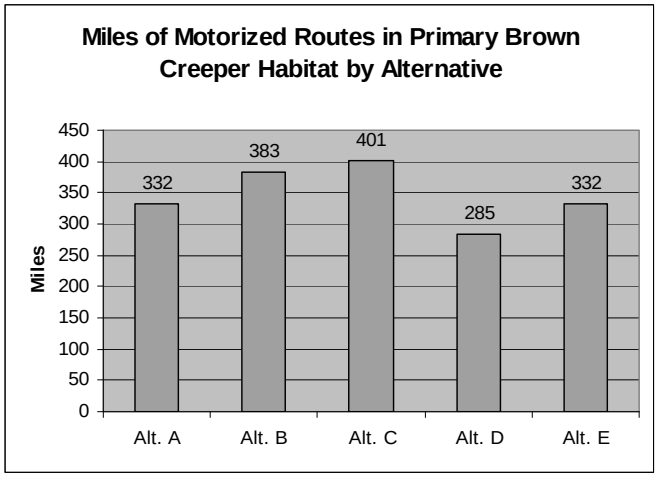

Figure 24. Miles of motorized routes in primary brown creeper habitat by alternative

The effects of disturbance are estimated using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. White spruce and ponderosa pine structural stages 4C and 5 offer the best habitat for brown creepers. None of the action alternatives would allow unrestricted motorized cross-country travel. This would have a positive effect on brown creepers by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in primary habitat, followed by Alternatives B, A, E, and D, respectively. The action alternatives would have a net positive effect on brown creepers due to the amount of habitat closed to motorized cross-country travel.

Brown creepers are also found in lower densities in other habitats including other structural stages of ponderosa pine. Effects of disturbance to brown creepers in ponderosa pine would be similar to those discussed earlier for ponderosa pine habitat.

None of the action alternatives are expected to reduce the Forestwide population. Forestwide populations are expected to remain stable or increase in all action alternatives. The action alternatives may have a better chance of population increases because of reduced disturbance from motorized cross-country travel. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards,

guidelines, or objectives that provide for brown creeper habitat. Under all alternatives, brown creepers are likely to persist on the Forest.

Golden-Crowned Kinglet

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Kinglets mostly forage in the tree canopies and would see little effects from routes on the ground. Effects on habitat condition and trend are expected to be minimal.

Spruce on the Black Hills is naturally distributed as patches at low abundance and there are gaps where spruce habitat is absent or only present in low abundance. However, the kinglets are mobile and disjunct areas of spruce habitat are typically be large enough and close enough to permit dispersal and interaction among subpopulations across the Forest. Conditions similar to this are expected to be maintained under Alternative A. Therefore, fragmentation of spruce habitat is not expected to adversely affect the species.

Based on the above analysis, the amount and condition of habitat is expected to remain stable. Alternative A contributes to conservation and maintenance of kinglet habitat (Forest Plan Objective 238).

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Disturbance effects to kinglets are expected to be similar to effects previously described for spruce habitat.

Game retrieval would have minimal effects on kinglets for Alternative A. Most game retrieval would occur outside the kinglet nesting season. Spring and summer dispersed camping could disturb nesting kinglets. Effects from dispersed camping are expected to be similar to general effects to wildlife discussed previously.

Alternative A is not expected to reduce the Forestwide population. Forestwide populations are expected to remain stable or increase.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn’t been formally designated. Kinglets mostly forage in the tree canopies and would have few effects from routes on the ground. Effects on habitat condition and trend are expected to be minimal.

Spruce on the Black Hills is naturally distributed as patches at low abundance and there are gaps where spruce habitat is absent or only present in low abundance. However, the kinglets are mobile and disjunct areas of spruce habitat are typically be large enough and close enough to permit dispersal and interaction among subpopulations across the Forest. Conditions similar to

this are expected to be maintained under all action alternatives. Therefore, fragmentation of spruce habitat is not expected to adversely affect the species.

Based on the above analysis, the amount and condition of habitat is expected to remain stable or increase. All action alternatives contribute to conservation and maintenance of kinglet habitat (Forest Plan Objective 238).

Game retrieval would have minimal effects on kinglets for all action alternatives. Most game retrieval would occur outside the kinglet nesting season. Spring and summer dispersed camping could disturb nesting kinglets. Effects from dispersed camping are expected to be similar to general effects to wildlife discussed previously.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Disturbance effects to kinglets for all action alternatives are expected to be similar to effects previously described for spruce habitat. Alternatives B and E have the most motorized routes in spruce habitat, followed by Alternatives C and D, respectively. Still, the action alternatives would have a net positive effect on kinglets due to the amount of habitat closed to motorized cross-country travel.

None of the action alternatives are expected to reduce the Forestwide population. Forestwide populations are expected to remain stable or increase in all action alternatives. The action alternatives may have a better chance of population increases because of reduced disturbance from motorized cross-country travel.

Under all alternatives, golden-crowned kinglets are likely to persist on the Forest. Spruce habitat would continue to be distributed as patches at low abundance and there may be gaps where spruce habitat is absent or only present in low abundance. However, the disjunct areas of spruce habitat would typically be large enough and close enough to permit dispersal and interaction among subpopulations across the Forest. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for kinglet habitat.

Grasshopper Sparrow

The grasshopper sparrow is also a Region 2 sensitive species. The effects to this species are evaluated in detail in the biological evaluation. A summary of effects to all sensitive species analyzed is located below on page 193.

Ruffed Grouse

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in grouse habitat, which could deter from the conservation and maintenance of grouse habitat (Forest Plan Objective 238).

The effects of disturbance are estimated by using the miles of routes in aspen habitat and the acreage of aspen open to cross-country travel. Alternative A would continue to allow

unrestricted motorized cross-country travel in much of this habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and would impact ruffed grouse. Alternative A would continue to allow 150 miles of motorized routes in aspen habitat.

Game retrieval would have minimal effects on ruffed grouse. Most game retrieval would occur during big game seasons outside the grouse nesting season. Spring and summer dispersed camping could disturb nesting grouse. Effects from dispersed camping are expected to be similar to general effects to wildlife discussed previously.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in the action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

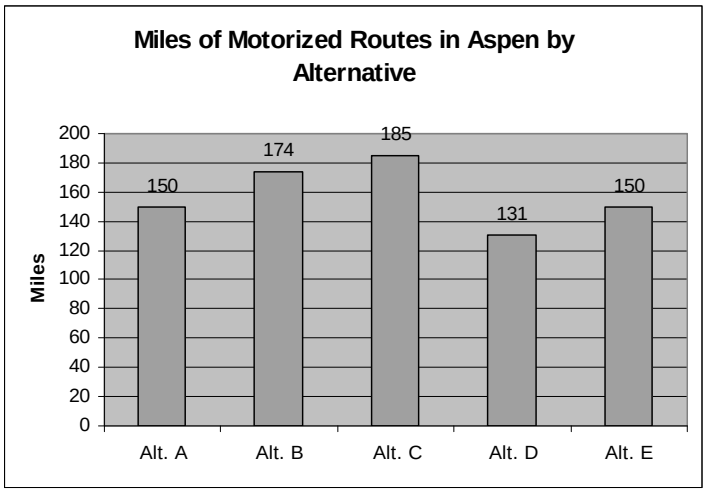

Figure 25. Miles of motorized routes in aspen by alternative on the Black Hills National Forest

All action alternatives contribute to conservation and maintenance of grouse habitat (Forest Plan Objective 238). The action alternatives would have a net positive effect by closing habitat to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The effects of disturbance are estimated by using the miles of routes in aspen habitat and the acreage of aspen open to cross-country travel. None of the action alternative would allow motorized cross-country travel. This would have a positive effect on grouse by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in grouse habitat, followed by Alternatives B, A, E, and D, respectively. The action alternatives would have a net positive effect on grouse due to the amount of habitat closed to unrestricted motorized cross-country travel.

Game retrieval would have minimal effects on ruffed grouse for all action alternatives. Most game retrieval would occur during big game seasons outside the grouse nesting season. Spring

and summer dispersed camping could disturb nesting grouse. Effects from dispersed camping are expected to be similar to general effects to wildlife discussed previously.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for ruffed grouse habitat. Under all alternatives, adequate habitat is expected to exist and ruffed grouse are likely to persist on the Forest.

Song Sparrow

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in song sparrow habitat. This could reduce the Forest's ability contribute to conservation of song sparrow habitat (Forest Plan Objective 238).

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects from disturbance are expected to mimic impacts to riparian habitat discussed earlier in the general wildlife effects section.

Game retrieval would have minimal effects on song sparrows in Alternative A. Most game retrieval would occur during big game seasons outside the nesting season. Spring and summer dispersed camping could disturb nesting song sparrows. Effects from dispersed camping are expected to be similar to those discussed earlier in the general wildlife effects section for riparian habitat.

The amount of riparian area is not expected to change substantially under Alternative A. Objectives, standards, and guidelines are designed to maintain or enhance riparian condition. Some individuals may be disturbed, but song sparrow populations are expected to remain stable in these riparian areas. This alternative would not change any of the standards, guidelines, or objectives that provide for song sparrow habitat. There would be adequate habitat for maintaining populations of song sparrows. Riparian habitats would be maintained through implementation of objectives, standards, and guidelines.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in the action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal. For general effects on riparian habitat, see the riparian discussion on page 180.

All action alternatives contribute to conservation of song sparrow habitat (Forest Plan Objective 238). Alternatives B, C, D, and E would contribute more to the conservation of habitat by

closing areas to unrestricted cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects from disturbance are expected to mimic impacts to riparian habitat discussed earlier in the general wildlife effects section.

Game retrieval would have minimal effects on song sparrows for all alternatives. Most game retrieval would occur during big game seasons outside the nesting season. Spring and summer dispersed camping could disturb nesting song sparrows. Effects from dispersed camping are expected to be similar to those discussed earlier in the general wildlife effects section.

The amount of riparian area is not expected to change substantially in all action alternatives. Objectives, standards, and guidelines are designed to maintain or enhance riparian condition. Some individuals may be disturbed, but song sparrow populations are expected to remain stable in these riparian areas. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines or objectives that provide for song sparrow habitat. Under all action alternatives, there would be adequate habitat for maintaining populations of song sparrows. Riparian habitats would be maintained implementation of objectives, standards, and guidelines.

Beaver

Alternative A

Acres of riparian areas and miles of streams are not expected to change under Alternative A. The effects on beaver would likely be reflected in the quality of riparian habitat rather than the quantity of riparian habitat. Effects to beavers would likely mirror effects to riparian and wetland areas. Effects on riparian areas are discussed earlier in the general wildlife section.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in beaver habitat. This could reduce the Forest’s ability contribute to conservation of beaver habitat (Forest Plan Objective 238).

Direct mortality from collisions is expected to occur, though infrequently. If collisions do occur, they are not likely to affect Forestwide populations. Alternative A would continue to allow unrestricted motorized cross-country travel near most beaver colonies. Impacts would continue to accrue as motorized recreation use levels increase. User-created routes would continue to be created and could impact beavers.

The area open to motorized game retrieval and motorized dispersed camping would be the highest in Alternative A. These types of uses would affect beaver streams if they result in crossing streams to access game or campsites.

Effects Common to All Action Alternatives

Acres of riparian areas and miles of streams are not expected to change under all action alternatives. The effects on beaver would likely be reflected in the quality of riparian habitat rather than the quantity of riparian habitat. Direct impacts to riparian and wetland ecosystems typically occur from direct disturbances such as the clearing of vegetation; roads or trails (e.g., stream crossings); and placement of fill material (e.g., development in a floodplain). Effects to

beavers would likely mirror effects to riparian and wetland areas. Effects on riparian areas are discussed earlier in the general wildlife section.

All action alternatives would contribute to conservation and maintenance of beaver habitat (Forest Plan Objective 238) by closing areas to unrestricted cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for beaver habitat. Under all alternatives, there would be adequate habitat for maintaining populations for beaver. Beaver populations are likely to remain stable or increase on the Forest in the future because hardwood ecosystems are expected to remain stable or increase, and riparian and aquatic ecosystem conditions are expected to remain stable.

Alternative B

Alternative B would reopen a closed road near beaver colonies along Lytle Creek (Bear Lodge Mountains). More routes would be added than dropped, which could provide more impacts than Alternative A. Motorized game retrieval (elk) and dispersed camping would be allowed along some roads near beaver streams. Users would not be allowed to cross the nearby stream to access game or campsites, which would avoid impacts. Alternative B closes the Forest to unrestricted motorized cross-country travel, which would be a benefit to most beaver streams. Most user-created routes near beaver streams would no longer be used. Alternative B would have a positive net effect on beavers.

Alternative C

Effects of Alternative C would be the same as Alternative B, since the same routes near beaver colonies would be added, and unrestricted motorized cross-country travel would not be allowed. Motorized game retrieval is allowed in some areas of the Forest for deer and elk. Users would not be allowed to cross the nearby stream to access game or campsites, which would avoid impacts. Dispersed camping would be allowed along some routes near beaver streams. This could affect beavers if users cross beaver streams to access campsites. Still, the net effect of Alternative C would be positive due to the closure of most of the Forest to unrestricted motorized cross-country travel.

Alternative D

Alternative D would have the least impact to beavers because it does not add new routes near beaver colonies, does not allow motorized game retrieval or dispersed camping off established routes, and closes the Forest to all motorized cross-country travel. Some existing routes near beaver colonies would remain open, so there would still be some level of effects. The net effect would be a positive one due to the closure of motorized cross-country travel, game retrieval and dispersed camping.

Alternative E

Alternative E would keep the existing road system similar to Alternative A, but would close the Forest to all motorized cross-country travel and would not allow motorized game retrieval or dispersed camping off established routes. There would still be some effects from existing roads, but the net effect would be positive due to the reduction in motorized cross-country travel, game retrieval and dispersed camping.

White-tailed Deer

Different structural stages in ponderosa pine offer different levels of habitat requirements for deer. Open forest conditions (structural stages 1, 2, 3A, and 4A) offer the best forage, including the best potential for understory shrubs. Structural stages 3C, 4C, and 5 offer the best conditions for cover including thermal cover. Structural stages 3B and 4B intermediate forage and cover but not optimum conditions for both.

Alternative A

Direct mortality from collisions is expected to occur. Most collisions are likely to occur on paved highways and on existing gravel roads that allow higher vehicle speeds. Collisions are not likely to affect Forestwide populations.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in deer habitat. This could reduce the Forest's ability contribute to conservation of deer habitat (Forest Plan Objective 238).

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. White-tailed deer are found in most habitat types on the Forest. The effects of disturbance from routes, game retrieval, and dispersed camping are expected to be similar to those displayed previously in the general effects to wildlife.

Executive Order 13443 (Facilitation of Hunting Heritage and Wildlife Conservation) directs the Department of Agriculture "to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat." Alternative A would have the most area open to motorized game retrieval and dispersed camping. Access for hunting would remain unchanged in this alternative.

The Forest Plan contains wintertime road density objectives in MAs 5.4 and 5.43 (Objective 5.4-207 and 5.43-205). These objectives strive for a wintertime open road density of one mile per square mile or less in these management areas. The Forest is currently above the objective in Management Area 5.4 and is currently meeting this objective in Management Area 5.43. Alternative A does not move the Forest towards meeting this objective in Management Area 5.4.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to occur in all action alternatives. Most collisions are likely to occur on paved highways and on existing gravel roads that allow higher vehicle speeds. Collisions of new routes are expected to be minimal because most are trails with slower traffic. Collisions are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in the action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. White-tailed deer are found in most habitat types on the Forest. The effects of disturbance from routes, game retrieval, and dispersed camping are expected to be similar to those displayed previously in the general effects to wildlife.

Motorized game retrieval can affect the State game agencies' ability to manage deer herds. It can influence how hunters disperse across the hunting units and affect the game and fish agency's ability to meet herd objectives. Alternative C may concentrate hunting in those small portions of hunting units open to game retrieval and reduce harvest in areas outside retrieval areas. Alternatives B, D, and E could limit State's ability to manage herds the most since motorized retrieval of deer would not be allowed off designated routes.

Motorized game retrieval may also affect hunter experience. Many hunters depend on their ATVs to retrieve downed deer. Hunters that depend on motorized game retrieval would experience a reduced opportunity to do so under Alternative C, and a greater reduction in opportunity in Alternatives B, D, and E. Alternatives B, D, and E would provide more opportunities for hunters who desire a more primitive type of game retrieval (horse or foot).

None of the alternatives would violate Executive Order 13443 and limit access to hunting areas due to the abundance of existing roads on the Forest that would remain open. The action alternatives would shift off-road hunting opportunities from motorized to nonmotorized by closing areas currently open to unrestricted cross-country travel. Alternative D would shift deer opportunities the most from roaded hunting opportunities to more traditional nonmotorized hunting opportunities.

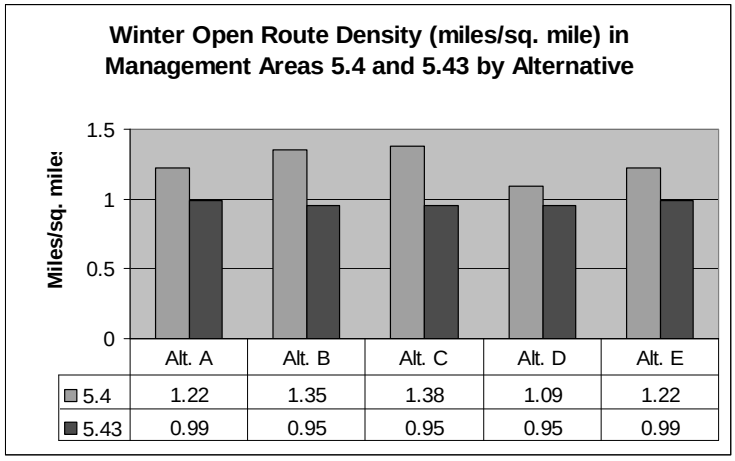

Figure 26. Comparison of winter open route density (miles/sq mile) in management areas 5.4 and 5.43 by alternative

All action alternatives contribute to conservation of white-tailed deer habitat (Forest Plan Objective 238) by closing areas to unrestricted cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The Forest Plan contains wintertime road density objectives in MAs 5.4 and 5.43 (Objective 5.4-207 and 5.43-205). These objectives strive for a wintertime open road density of one mile per square mile or less in these management areas. The Forest is currently above the objective in Management Area 5.4 and is currently meeting this objective in Management Area 5.43. All action alternatives continue to meet the objective for Management Area 5.43. Alternatives B, C, and D reduce the density slightly from current conditions in Management Area 5.43. Alternative E does not move the Forest towards meeting this objective in Management Area 5.4. Alternatives B and C move the Forest away from the objective for Management Area 5.4. Alternative D is the only alternative that moves the Forest towards the objective for Management Area 5.4. This is based on miles of Forest jurisdiction routes on National Forest System land.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for white-tailed deer habitat. Under all alternatives, there would be adequate habitat for white-tailed deer on the Forest. Open forest conditions in ponderosa pine are expected to remain stable across the Forest, which would maintain available forage, including understory shrubs. None of the

alternatives are expected to effect the Forestwide population of white-tailed deer. There may be fewer disturbances under Alternatives B, C, D, and E due to reduced cross-country travel, but the population should continue to be stable in the foreseeable future.

Threatened and Endangered Species

Black-footed ferret

All alternatives are expected to have no effect on black-footed ferrets. The only prairie dog town that is likely to have ferrets is the town next to Wind cave National Park in Norbeck Wildlife Preserve. The Preserve is currently closed to public motorized travel and would continue to be closed under all action alternatives. No new roads are proposed near Wind Cave National Park in any alternative. Alternatives B, C, and D close some roads near Wind Cave National Park, but not where ferrets are likely to occur.

Sensitive Species

Effects to Region 2 sensitive species are discussed in detail in a biological evaluation. The effects determinations for Region 2 sensitive wildlife and fish species are summarized below.

The following R2 sensitive animal species have a determination of "**no impact**" for all alternatives

- Ferruginous hawk (*Buteo regalis*)
- Mountain plover (*Charadrius montanus*)
- Northern harrier (*Circus cyaneus*)
- Peregrine falcon (*Falco peregrinus*)

The following R2 sensitive animal species have a determination of "**may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing**" for all alternatives:

- Cooper's mountain snail (*Oreohelix strigosa cooperi*)
- Regal fritillary (*Speyeria idalia*)
- Northern leopard frog (*Rana pipiens*)
- Black Hills redbelly snake (*Storeria occipitomaculata pahasapa*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Black-backed woodpecker (*Picoides arcticus*)
- Burrowing owl (*Athene cunicularia*)
- Flammulated owl (*Otus flammeolus*)
- Grasshopper sparrow (*Ammodramus savannarum*)
- Lewis' woodpecker (*Melanerpes lewis*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Northern goshawk (*Accipiter gentilis*)
- Three-toed woodpecker (*Picoides dorsalis*)
- Yellow-billed cuckoo (*Coccyzus americanus*)
- Long-billed curlew (*Numenius americanus*)
- Black-tailed prairie dog (*Cynomys ludovicianus*)

- Rocky Mountain bighorn sheep (*Ovis canadensis*)
- American marten (*Martes americana*)
- Fringed myotis (*Myotis thysanodes*)
- Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)

Cooper's Mountain Snail

Alternative A

Direct mortality from vehicles is possible for this alternative. Undiscovered colonies could be impacted if routes and cross-country travel run through them. The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered colonies. The effects of motorized routes, motorized cross-country travel, motorized game retrieval, and motorized dispersed camping on snails are expected to be similar to the general discussion on riparian, hardwood and forested habitat under General Effects to Wildlife and Habitat Components.

The Forest Plan provides direction on managing snail colonies (Standard 3103). No new routes are proposed in known sensitive snail colonies. Game retrieval and dispersed camping could occur on known snail colonies.

Road maintenance would likely affect snail colonies in this alternative. Road right-of ways are often brushed, including along State highways. This activity would likely continue for public safety reasons. The effects from these activities are not expected to change from current levels for this alternative.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in snail habitat and crush undiscovered snails. This could reduce the Forest's ability contribute to conservation of snail habitat (Forest Plan Objective 221).

Effects Common to All Action Alternatives

Direct mortality from vehicles is possible for all action alternatives. None of the action alternatives propose new routes in known colonies. Undiscovered colonies could be impacted in all action alternatives. The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered colonies. The effects of motorized routes, motorized cross-country travel, motorized game retrieval, and motorized dispersed camping on snails are expected to be similar to the general discussion on riparian, hardwood and forested habitat under General Effects to Wildlife and Habitat Components.

The Forest Plan provides direction on managing snail colonies (Standard 3103). No new routes are proposed in known sensitive snail colonies. All designed routes in the action alternatives are consistent with Standard 3103. Game retrieval and dispersed camping could occur on known snail colonies. If conflicts arise, Standard 3103 would be followed. Therefore, all action alternatives are consistent with the Forest Plan.

Downed woody material is an important habitat feature for snails. Downed wood removal is not authorized under any action alternative. Effects are expected to be minimal.

Road maintenance would likely affect snail colonies in all action alternatives. Road rights-of way are often brushed, including along State highways. This activity would likely continue for public safety reasons. The effects from these activities are not expected to change from current levels for all action alternatives.

All action alternatives contribute to conservation of snail habitat (Forest Plan Objective 221). The action alternatives are expected to have a net benefit to snails by closing areas to unrestricted cross-country travel. Alternative D would have the most net benefit because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. Individuals may be directly impacted by vehicles running over them. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines or objectives that provide for snail habitat. Riparian areas would be maintained. The snail-specific direction (Standard 3103) for known snail colonies would be followed for all alternatives.

Regal Fritillary

Alternative A

Direct mortality from collisions could occur in this alternative. The risk of direct mortality would be consistent with existing conditions. However, Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could cause additional direct mortality and could further affect vegetation in fritillary habitat. This could reduce the Forest's ability contribute to conservation of fritillary habitat (Forest Plan Objective 221).

The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered occurrences. Impacts to fritillary habitat are expected to be similar to those displayed in the general discussion section for grassland habitat under General Effects to Wildlife and Habitat Components. The effects of motorized game retrieval and dispersed camping are also expected to be similar to those discussed in the General Effects to Wildlife and Habitat Components.

Invasive weeds can affect butterflies through competition with larval host plants. Effects are expected to be similar to those displayed in the general discussion under General Effects to Wildlife and Habitat Components.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

Direct mortality from vehicles is possible for all action alternatives. The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered colonies. Impacts to fritillary habitat are expected to be similar to those displayed in the general discussion section for grassland habitat

under General Effects to Wildlife and Habitat Components. The effects of motorized game retrieval and dispersed camping on regal fritillary habitat are also expected to be similar to those discussed in the General Effects to Wildlife and Habitat Components.

Invasive weeds can also affect butterflies through competition with larval host plants. Effects are expected to be similar to those displayed in the general discussion under General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of butterfly habitat (Forest Plan Objective 221). The action alternatives are expected to have a net benefit to habitat by closing areas to cross-country travel. Alternative D would have the most net benefit because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Based on the few observations ever recorded and the limited amount of suitable habitat, the Black Hills does not appear to have an established population of regal fritillaries. Periodic appearance and disappearance may be a naturally occurring pattern for the species in this region (USDA Forest Service 2000b), and therefore, management could occasionally have effects to a limited number of individuals. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for regal fritillary habitat.

Northern Leopard Frog

Eggs, larval, and adult leopard frogs may be killed or injured by variety of activities such as on- and off-road vehicle traffic associated with recreation or in the course of vegetation management treatments (timber harvest, prescribed burning, wildfire suppression, noxious weed treatment). Implementation of standards and guidelines, watershed conservation practices, and State best-management practices (BMPs) emphasize the protection of riparian and aquatic habitats.

Indirect effects occur to this species in a variety of ways. Motorized vehicle activities may displace or compact soils and remove or disturb ground litter. Compaction by any activity can reduce infiltration capacity. Stream crossings can damage channel stability and increase sediment input. Water quality may be affected by chemical applications or contaminated surface water runoff.

Alternative A

Direct mortality is possible under this alternative. Implementation of standards and guidelines, watershed conservation practices, and State best-management practices (BMPs) emphasize the protection of riparian and aquatic habitats but would not completely avoid the direct effects to this species. Some individual eggs, larval and adult frogs could be crushed by vehicles crossing streams on routes or going cross-country.

The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel is used here to estimate effects to leopard frogs. Effects from motorized routes, cross-country travel, game retrieval, and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components, especially those effects to riparian habitat.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could further affect vegetation in leopard frog habitat. This could reduce the Forest's ability contribute to conservation of leopard frog habitat (Forest Plan Objective 221).

Effects Common to All Action Alternatives

Direct mortality is possible under all action alternatives. Implementation of standards and guidelines, watershed conservation practices, and State best-management practices (BMPs) emphasize the protection of riparian and aquatic habitats but would not completely avoid the direct effects to this species. Some individual eggs, larval and adult frogs could be crushed by vehicles crossing streams on routes or going cross-country.

Effects from motorized routes, cross-country travel, game retrieval and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components, especially those effects to riparian habitat.

All action alternatives contribute to conservation of frog habitat (Forest Plan Objective 221). All action alternatives are expected to have a net benefit to habitat by closing areas to cross-country travel. Alternative D is expected to have the most net benefit because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. This species is common in suitable habitat on the Forest. Individuals may be impacted be vehicles crossing wet habitat. Implementation of standards, guidelines, watershed conservation practices, and BMPs would maintain and protect aquatic, riparian and upslope areas in a condition and quantity that continues to support well-distributed, reproductive populations. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for leopard frog habitat.

Black Hills Redbelly Snake

Alternative A

Direct mortality from vehicles could occur in this alternative. Individuals at undiscovered hibernacula could be affected access by user-created routes and motorized cross-country travel. The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel are used here to estimate effects to redbelly snakes. The effects of motorized routes, cross-country travel, game retrieval, and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components, particularly riparian and hardwood habitats.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could further affect vegetation in redbelly snake habitat. This could reduce the Forest's ability contribute to conservation of redbelly snake habitat (Forest Plan Objective 221).

Effects Common to All Action Alternatives

Direct mortality from vehicles could occur in all action alternatives. No new routes are proposed at known hibernacula (Standard 3116), but undiscovered ones could be affected. The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel are used here to estimate effects to redbelly snakes. The effects of motorized

routes, cross-country travel, game retrieval, and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components, particularly riparian and hardwood habitats.

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

All action alternatives contribute to conservation of redbelly snake habitat (Forest Plan Objective 221). Alternatives B, C, D, and E are expected to contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D is expected to conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest if Forest Plan standards are followed. This project would not change any of the standards, guidelines or objectives that provide for redbelly snake habitat. Black Hills redbelly snakes would likely continue to persist across the Forest under all alternatives.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. Individuals may be impacted by being run over by vehicles. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for redbelly snake habitat. Implementation of Forestwide objectives, standards, and guidelines would conserve and enhance suitable Black Hills redbelly snake habitats and the habitats of important invertebrate prey species. Riparian and hardwood areas would be maintained, providing continued habitat for the species.

American Three-Toed Woodpecker

Alternative A

Direct mortality from collisions may occur but is expected to be minimal. Due to the maneuverability of woodpeckers, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations. All alternatives contribute to conservation of woodpecker habitat (Forest Plan Objective 221) by maintaining current conditions.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to motorized cross-country travel, game retrieval and dispersed camping. Effects of motorized routes, cross-country travel, game retrieval, and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components, particularly spruce and snag habitat. Alternative A allows the most motorized cross-country travel. This would have the most potential for disturbance to three-toed woodpeckers.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of woodpeckers, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to motorized cross-country travel, game retrieval and dispersed camping. Effects of motorized routes, cross-country travel, game retrieval, and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components, particularly spruce and snag habitat.

All action alternatives would contribute to conservation of woodpecker habitat (Forest Plan Objective 221). Alternatives B, C, D and E are expected to contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D is expected to conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Individuals may be disturbed or killed by vehicles, but it is not expected to threaten populations. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for woodpecker habitat. All alternatives would likely allow the three-toed woodpecker to persist on the Forest.

Bald Eagle

Potential impacts from Forest activities could include disturbance at roost or nest sites, changes in prey availability, and impacts to forested habitats used for roosting, nesting, and perching.

Alternative A

Vehicle-killed wildlife is a major food source for wintering bald eagles on the Forest. Direct mortality from collisions is possible in this alternative, given that deer carcasses can occur along highly used routes. Collisions are more likely to occur along highways and major gravel roads that allow higher vehicle speeds. Lower speed routes such as those on most of the Forest are much less likely to result in collisions. Due to the maneuverability of bald eagles, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

The effects of disturbance to wintering eagles is estimated by using the miles of routes Forestwide and the acreage of Forest open to cross-country travel. Effects from disturbance are expected to be similar to general effects discussed under General Effects to Wildlife and Habitat Components. This alternative has the most potential for disturbance from motorized travel because it has the most area open to motorized cross-country travel. This alternative contributes to conservation of eagle habitat (Forest Plan Objective 221) by maintaining habitat similar to current conditions.

Effects Common to All Action Alternatives

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

Effects to the known nest at Deerfield Lake are expected to be minimal. To be consistent with Standard 3101, no new routes are proposed near the nest.

The effects of disturbance to wintering eagles is estimated by using the miles of routes Forestwide and the acreage of Forest open to cross-country travel. Effects from disturbance are expected to be similar to general effects discussed under General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of eagle habitat (Forest Plan Objective 221). Alternatives B, C, D and E are expected to contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D is expected to conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Motorized activity may disturb some individuals or flush them from carrion along motorized routes. There is also a slight chance that an eagle could be struck by a vehicle as it is flushed from carrion along a route. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that protect bald eagles or provide for eagle habitat.

Black-Backed Woodpecker

Information on effects of motorized use on black-backed woodpeckers is limited. As with many wildlife species, black-backs may be affected by roads through direct mortality, habitat alteration and disturbance.

Alternative A

Direct mortality from collisions is possible. Due to the maneuverability of woodpeckers, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. No new construction is planned as part of this alternative. Motorized cross-country travel would continue to be allowed under this alternative, which could lead to more user-created routes. This could affect snag habitat through increased potential for illegal cutting of snags and could affect the Forest's ability conserve and maintain black-backed woodpecker habitat (Forest Plan Objectives 221 and 238).

Habitat fragmentation is not expected to be limited under this alternative. Black-backs have adapted to take advantage of the sporadic occurrence of fire and insects. They are highly mobile and able to colonize habitat, especially burned areas.

Black-backed woodpecker populations on the Forest are doing well due to the recent fire and insect activity over the last 8 years. Black-backed woodpecker populations would likely decline from current levels under this alternative because the above average amount of recent insect activity and stand-replacing fires would not be sustained.

Ortega and Capen (2002) found that some forest birds had lower densities near unpaved roads. The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Recently burned areas and ponderosa pine structural stages 4C and 5 offer the best habitat for black-backs. Alternative A would continue to

allow unrestricted motorized cross-country travel in much of this habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and would impact black-backs.

Motorized use of roads and trails can also disturb wildlife. Alternative A would continue to allow 348 miles of motorized routes in burned habitat and 332 miles in pine structural stages 4C and 5. Disturbance from these routes is expected to continue at the current level. Black-backs also use other pine structural stages. Effects in other pine structural stages are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components (ponderosa pine habitat).

Effects Common to All Action Alternatives

Direct mortality from collisions is possible in all action alternatives. Due to the maneuverability of woodpeckers, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

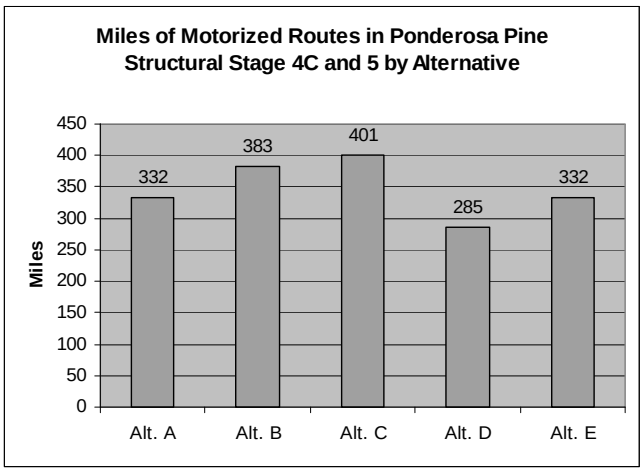

Figure 27. Miles of motorized routes in ponderosa pine structural stages 4C and 5 by alternative

Habitat fragmentation would not be limiting to black-backs. Black-backed woodpecker populations are often irruptive as they follow outbreaks of wood-boring beetles after fires (Dixon and Saab 2000; USDA Forest Service 2000a). Black-backs have adapted to take advantage of the sporadic occurrence of fire. They are highly mobile and able to colonize habitat, especially burned areas.

Impacts to snag habitat is expected to be minimal for all action alternatives. None of the alternatives would authorize the cutting or removing of snags. Some illegal snag cutting may occur under all action alternatives. Alternatives B, C, D, and E are expected to have less risk of illegal snag cutting than Alternative A due to less area being open to cross-country travel.

Black-backed woodpecker populations on the Forest are doing well due to the recent fire and insect activity over the last 8 years. Black-backed woodpecker populations would likely decline from current levels under all action alternatives because the above average amount of insect activity and stand-replacing fires would not be sustained.

None of the action alternatives would allow unrestricted motorized cross-country travel. This is expected to have a positive effect on black-backs by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in primary habitat, followed by Alternatives B, E, and D, respectively. Still, the action alternatives would have a net positive effect on black-backed woodpeckers due to the amount of habitat closed to motorized cross-country travel.

Black-backs also use other pine structural stages. Effects are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components (ponderosa pine habitat).

None of the action alternatives are expected to cause a reduction of black-backed woodpeckers on the Forest. Populations would be more dependent on availability of recently burned forest and insect epidemics.

All action alternatives contribute to conservation and maintenance of black-backed woodpecker habitat (Forest Plan Objectives 221, 238). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

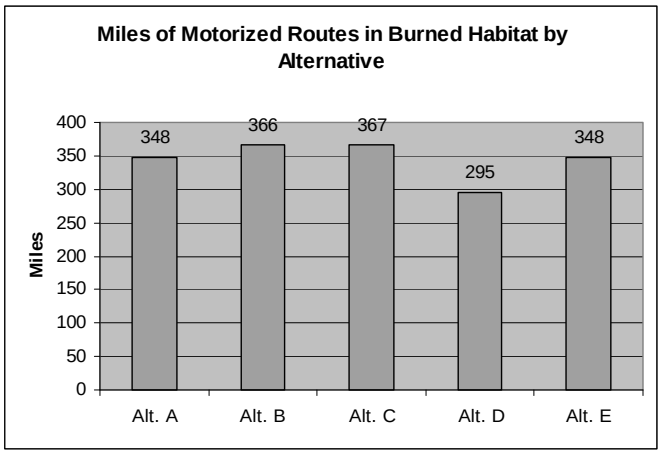

Figure 28. Miles of motorized routes in burned habitat by alternative

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for black-backed habitat. Under all alternatives, black-backed woodpeckers are likely to persist on the Forest. Populations may return to levels found by (Mohren 2002) prior to the recent spike in acres burned by fire or killed by insects.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Individuals would be affected by disturbance under all alternatives. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for woodpecker habitat. All alternatives would likely allow the black-backed woodpecker to persist on the Forest.

Burrowing Owl

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of these owls, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Due to the strong association of nesting burrowing owls with prairie dog towns, management actions and direction affecting black-tailed prairie dogs are likely to affect the suitability of burrowing owl habitat on the Forest. This alternative proposes no new routes. Existing routes would continue to provide access to and through prairie dog towns. This alternative would

continue to allow unrestricted motorized cross-country travel on prairie dog towns, which could lead to additional user-created routes in prairie dog towns. Any additional user-created routes may lead to a reduction in habitat for burrowing owls.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects from disturbance are expected to be similar to those shown for grassland habitat under General Effects to Wildlife and Habitat Components. See also, the prairie dog discussion.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of these owls, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations. No new routes are proposed near currently known burrowing owl nests consistent with Forest Plan Standard 3204.

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects from disturbance are expected to be similar to those shown for grassland habitat under General Effects to Wildlife and Habitat Components. See also, the prairie dog discussion.

All alternatives contribute to conservation of burrowing owl habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel. None of the alternatives propose new routes near nest locations, consistent with Standard 3204.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. Individuals may be affected by vehicle collisions and disturbance. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines or objectives that provide for prairie dog and burrowing owl habitat.

Ferruginous Hawk

Alternative A

Ferruginous hawks are not known to nest on the Forest; therefore, motorized recreation activities are unlikely to directly affect this species in all alternatives. Generally, ferruginous hawks may be affected by habitat loss due to conversion of grassland to agriculture and the availability of prey populations, including prairie dogs. Impacts to potential habitat are expected to be reflected in the impacts to grassland and prairie dog towns. For a discussion of general effects to grassland habitat, see General Effects to Wildlife and Habitat Components. A discussion of effects on prairie dogs is presented later in this section. Activities in these areas are unlikely to affect ferruginous hawks due to their low occurrence on the Forest. This alternative is unlikely to affect adjacent prairies outside the Forest boundary.

Effects Common to All Action Alternatives

Effects are expected to be similar to Alternative A. Impacts to potential habitat are expected to be reflected in the impacts to grassland and prairie dog towns. For a discussion of general effects to grassland habitat, see General Effects to Wildlife and Habitat Components. A discussion of effects on prairie dogs is presented later in this section. Activities in these areas are unlikely to affect ferruginous hawks due to their low occurrence on the Forest. This alternative is unlikely to affect adjacent prairies outside the Forest boundary.

All action alternatives contribute to conservation of ferruginous hawk potential habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of potential habitat by closing areas to unrestricted motorized cross-country travel. Alternative D would conserve potential habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives would have no impact. Ferruginous hawks have not been documented on the Forest, but might occur here during migration. Potential habitat is naturally limited in the Black Hills, but would continue to exist at current levels. Reducing cross-country travel in grasslands and prairie dog towns is not expected to improve habitat enough to affect ferruginous hawk populations.

Flammulated Owl

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of these owls, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

This alternative would continue current snag management. Some snags could be illegally cut for firewood. The amount of area open to unrestricted motorized cross-country travel in this alternative could lead to additional user-created routes, which could lead to a higher potential for illegal snag cutting. If illegal snag cutting increases, potential habitat would decrease.

The effects of disturbance are expected to be minimal due to the owl's limited occurrence on the Forest. Effects of motorized routes, cross-country travel, game retrieval, and dispersed camping on potential habitat (spruce, ponderosa pine and snags) are discussed under General Effects to Wildlife and Habitat Components.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of these owls, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

Impacts to snag habitat is expected to be minimal for all action alternatives. None of the alternatives would authorize the cutting or removing of snags. The action alternatives may have

less potential for illegal snag removal than Alternative A because they have less area open to motorized cross-country travel.

The effects of disturbance are expected to be minimal for all action alternatives due to the owl's limited occurrence on the Forest. Effects of motorized routes, cross-country travel, game retrieval, and dispersed camping on potential habitat (spruce, ponderosa pine and snags) are discussed under General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of potential flammulated owl habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of potential habitat by closing areas to unrestricted cross-country travel. Alternative D would conserve potential habitat the most because it has the least amount of habitat with routes and cross-country travel.

The effects described could occur under all action alternatives. However, there would likely be little impact on the number, reproduction, or survival of flammulated owls. This is because a large amount of currently unoccupied but suitable habitat would still be available for owl colonization. Furthermore, the low reproductive output of flammulated owls would necessitate many years of breeding before the habitat became fully occupied. Therefore, no alternative would likely stifle the establishment of a flammulated owl population in the Black Hills.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. The flammulated owl occurs in the Black Hills region at the eastern end of its breeding distribution, and few occurrences of this species have been documented on the Forest. At present, there is no information suggesting that flammulated owls are established or breeding in the area.

This project would not change any of the standards, guidelines, or objectives that provide for flammulated owl habitat. Due to the low occurrence of this species on the Forest in relation to the amount of potentially suitable habitat, no alternative is likely to affect the colonization by or establishment of flammulated owls on the Forest.

Grasshopper Sparrow

As with many wildlife species, grasshopper sparrows may be affected by roads through direct mortality, habitat alteration, and disturbance. Motorized use can also increase the risk of invasive plants that can indirectly affect habitat.

Alternative A

Direct mortality from collisions is possible. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

This alternative would not construct any new routes. Alternative A allows unrestricted motorized cross-country travel on much of the grassland habitat, which could lead to additional user-created routes in the future. User-created routes could reduce habitat availability and affect the Forest's ability to conserve habitat (Forest Plan Objectives 221, 238) in the future.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects to grasshopper sparrows are expected to

be similar to those shown for grassland habitat under General Effects to Wildlife and Habitat Components.

Grasshopper sparrow population would be expected to remain stable on the Forest under this alternative.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated.

Effects on habitat condition and trend are expected to be minimal. Grassland habitat is distributed as patches at low abundance, and there are gaps where grassland habitat is absent or only present in low abundance, especially in the northern and central Black Hills. However, grassland habitat in the southern Black Hills would typically be large enough and close enough to permit dispersal and interaction among subpopulations. These conditions would continue to exist for all action alternatives. Grasshopper sparrow habitat is likely to remain stable or increase in the future for all action alternatives. If standards and guidelines are followed, existing grasslands would likely be adequately conserved until grassland restoration objectives are achieved.

Since little change is expected in the amount of habitat, future distribution would likely be similar to current conditions, with expansion around existing grasslands. Distribution of grasshopper sparrows would likely follow the same pattern as habitat described above.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects to grasshopper sparrows are expected to be similar to those shown for grassland habitat under General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation and maintenance of grasshopper sparrow habitat (Forest Plan Objectives 221, 238). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Forestwide population trends are expected to remain stable under all action alternatives. The action alternatives have the greatest potential for population increases, but populations could be limited by other factors such as climate or predation.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for grasshopper sparrow habitat. Under all alternatives, there would be adequate habitat for maintaining populations of grasshopper sparrows.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. Some individuals may be

affected under all alternatives through direct mortality or disturbance. However, all alternatives may maintain or improve habitat by maintaining or reducing areas open to cross-country travel. These measures may benefit individual grasshopper sparrows. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for grasshopper sparrow habitat. Regional downward trends may persist due to continued grassland habitat loss and degradation off the Forest.

Lewis's Woodpecker

Alternative A

Direct mortality from collisions is possible. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Structural stage 4A and 5 most closely resemble the preferred nesting, foraging, and roosting habitat for the Lewis's woodpecker. Structural stage 4A contains mature stands with less than 40 percent canopy cover. Structural stage 5 stands were subjectively determined to contain late-successional characteristics and could have any amount of canopy cover. Therefore, some but not all acres in structural stage 5 could provide suitable habitat for the Lewis's woodpecker. Continued motorized cross-country travel could lead to more user-created routes on the Forest, but these routes would likely effect ground vegetation and have little effect on forest overstory. These routes could lead to more potential illegal snag removal, which would reduce habitat for Lewis's woodpeckers. This alternative is expected to conserve Lewis's woodpecker habitat, but to a lesser degree than the action alternatives.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Burned areas and ponderosa pine structural stages 4A and 5 offer the best habitat for Lewis' woodpeckers. Alternative A would continue to allow motorized cross-country travel in much of this habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and would impact Lewis' woodpeckers.

Motorized use of roads and trails can also disturb wildlife. Alternative A would continue to allow motorized travel on 348 miles of routes in burned habitat and 975 miles of routes in pine Structural Stages 4C and 5. Motorized activity on these routes could disturb Lewis's woodpeckers nesting near the routes.

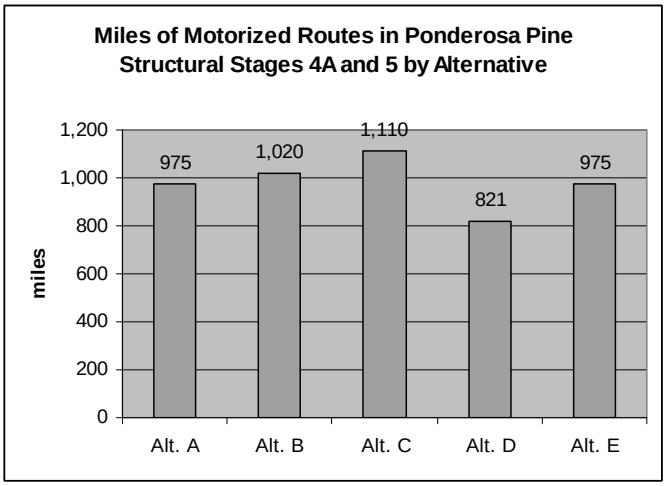

Figure 29. Miles of motorized routes in ponderosa pine structural stages 4A and 5 by alternative

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action

alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

Snags are a very important component of Lewis's woodpecker habitat. Impacts to snag habitat is expected to be minimal for all action alternatives. None of the action alternatives would authorize the cutting or removing of snags. The reduction in motorized cross-country travel would likely reduce the potential for illegal removal of snags.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Burned areas (see Figure 28) and ponderosa pine structural stages 4A and 5 offer the best habitat for Lewis' woodpeckers. None of the action alternative would allow motorized cross-country travel. This is expected to have a positive effect on Lewis' woodpeckers by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in primary habitat, followed by Alternatives B, E, and D, respectively. Still, the action alternatives are expected to have a net positive effect on Lewis' woodpeckers due to the amount of habitat closed to motorized cross-country travel. Effects of motorized game retrieval and dispersed camping are expected to be similar to those shown under General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of woodpecker habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Some individuals may be impacted through collisions or disturbance from vehicles. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for woodpecker habitat. All alternatives would provide habitat in mature, open-canopied condition.

Loggerhead Shrike

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Alternative A would continue to allow unrestricted motorized cross-country travel in grassland and shrubland habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue and would impact Lewis' woodpeckers and their habitat. Effects are expected to be similar to those shown for shrubland

and grassland habitats under General Effects to Wildlife and Habitat Components. Effects of motorized game retrieval and dispersed camping are also expected to be similar to those shown in General Effects to Wildlife and Habitat Components.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance are estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects are expected to be similar to those shown for shrubland and grassland habitats under General Effects to Wildlife and Habitat Components. Effects of motorized game retrieval and dispersed camping are also expected to be similar to those shown in General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of shrike habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. All alternatives may affect individuals through vehicle collisions or disturbance. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for shrike habitat. All alternatives would maintain or improve grass and shrub communities, which would generally be beneficial to shrikes.

Long Billed Curlew

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Alternative A would continue to allow unrestricted motorized cross-country travel in grassland habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue and would impact long-billed curlews and their habitat. Effects are expected to be similar to those shown for grassland habitats under General Effects to Wildlife and Habitat Components.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects are expected to be similar to those shown for grassland habitat under General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of curlew habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Individuals may be affected by vehicle collisions or disturbance in all alternatives. This project would not change any of the standards, guidelines, or objectives that provide for curlew habitat. Alternative A would maintain grassland habitat and the other alternatives may improve grassland habitat by closing cross-country travel. Therefore, curlews are likely to persist on the Forest.

Mountain Plover

Effects Common to All Alternatives

None of the alternatives is expected to impact mountain plovers because none has been recorded on the Forest. Impacts to potential habitat are expected to be reflected in the impacts to grassland and prairie dog towns. For a discussion of effects to grassland habitat, see General Effects to Wildlife and Habitat Components. Effects on prairie dogs are discussed later in this document. Activities in these areas are unlikely to affect mountain plovers due to their lack of occurrence on the Forest. The project is unlikely to affect adjacent prairies outside the Forest boundary.

All alternatives contribute to conservation of potential plover habitat (Forest Plan Objective 221). Alternative A would maintain current conditions. Alternatives B, C, D, and E would contribute more to the conservation of habitat by closing areas to unrestricted cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives would have no impact. There is very little suitable mountain plover habitat on or near the Forest, and mountain plovers have not been documented in the vicinity. Although grassland habitats in general would be maintained across the Forest, the proportion of grasslands that provide suitable plover habitat (e.g., short, disturbed grasslands) would remain essentially unchanged for all alternatives.

Northern Goshawk

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Effects on habitat condition and trend are expected to be minimal and consistent with Standard 3108. Alternative A proposes no new roads so there would be no new disturbances near goshawk nests (Standard 3111). Alternative A would continue to allow unrestricted motorized cross-country travel on much of the Forest, which would continue current disturbance near goshawk nests.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Goshawks forage in most habitat types on the Forest on a variety of prey. Disturbance to foraging goshawks are expected to be similar to those shown for general habitat effects under General Effects to Wildlife and Habitat Components.

Moderately dense mature forest habitat (structural stages 4B, 4C, and 5) constitutes the best nesting habitat. Disturbance can be expected to continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts are expected to continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and would impact goshawks.

Motorized use of roads and trails can also disturb wildlife. Alternative A would continue to allow motorized use on 930 miles of routes in nesting habitat (structural stages 4B, 4C, and 5). Effects of motorized game retrieval and dispersed camping are also expected to be similar to those discussed in the general wildlife section (General Effects to Wildlife and Habitat Components).

Alternative A would continue to conserve goshawk habitat (Forest Plan Objective 221) but may be more challenging than the action alternatives if additional user-created routes are created in areas where motorized cross-country travel is allowed.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn’t been formally designated. Effects on habitat condition and trend are expected to be minimal and consistent with Standard 3108. Impacts to snag habitat is expected to be minimal and consistent with the Forest Plan for all action alternatives. None of the action alternatives would authorize the cutting or removing of snags.

All action alternatives are consistent with Forest Plan goshawk standards. No trees are proposed for removal in goshawk habitat so all action alternatives are consistent with Standard 3108. Alternative E proposes no new roads so there would be no new disturbances near goshawk nests (Standard 3111). In Alternatives B, C, and D, newly designated routes within 0.5 mile of active

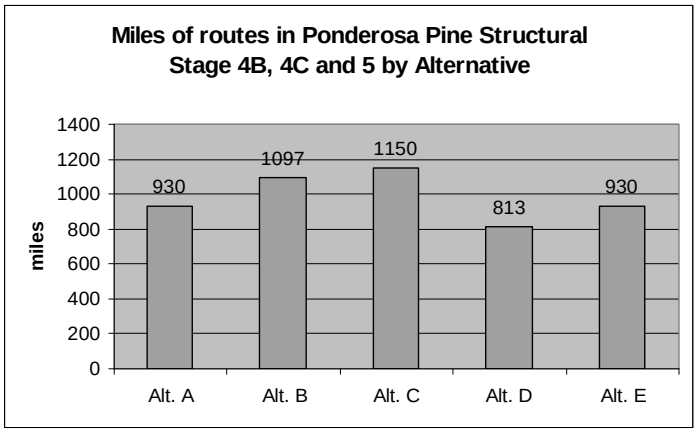

Figure 30. Miles of motorized routes in ponderosa pine structural stages 4B, 4C and 5 by alternative

goshawk nests are minimized and/or would be closed seasonally from April 1 through August 15 to minimize disturbances at nests (Standard 3111).

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Goshawks forage in most habitat types on the Forest on a variety of prey. Disturbance to foraging goshawks are expected to be similar to those shown for general habitat effects under General Effects to Wildlife and Habitat Components.

Moderately dense mature forest habitat (structural stages 4B, 4C, and 5) constitutes the best nesting habitat. None of the action alternative would allow unrestricted motorized cross-country travel. This is expected to have a positive effect on goshawks by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in nesting habitat, followed by Alternatives B, E, and D, respectively. Still, the action alternatives are expected to have a net positive effect on goshawks due to the amount of habitat closed to motorized cross-country travel.

Effects of motorized game retrieval and dispersed camping are expected to be similar to those discussed in the general wildlife section (General Effects to Wildlife and Habitat Components).

All action alternatives would contribute to conservation of goshawk habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing. Individuals would be affected under all alternatives as discussed above. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for goshawk habitat. Individual goshawks may be disturbed by motor vehicles but not to the level of affecting populations.

Northern Harrier

Effects Common to All Alternatives

None of the alternatives is expected to impact harriers due to their limited occurrence on the Forest. Impacts to potential habitat are expected to be reflected in the impacts to grassland and shrublands. For a discussion of general effects to grassland and shrubland habitat, see General Effects to Wildlife and Habitat Components. Activities in these areas are unlikely to affect

harriers due to their low occurrence on the Forest. The project is unlikely to affect adjacent prairies outside the Forest boundary.

All alternatives contribute to conservation of potential harrier habitat (Forest Plan Objective 221). Alternative A would maintain current conditions. Alternatives B, C, D, and E would contribute more to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives would have no impact. No actions would be taken under any alternative that would appreciably affect the survival or reproduction of the northern harrier. To date, northern harriers have never been known to breed or winter on the Forest. Sufficient quality and quantity of habitat would be available for migrating or transient harriers under all alternatives.

Peregrine Falcon

Effects Common to All Alternatives

The peregrine falcon does not currently breed in the Black Hills and is considered uncommon even during migration. Because of this, all alternatives would have no effects. Potential nest sites would be difficult to access with motorized vehicles due to the stability and inaccessibility of rock cliffs. Potential foraging habitat could be disturbed by motorized travel, but considering the current preponderance of unutilized habitat, it is unlikely such activities would affect future use by peregrines. In summary, none of the alternatives would affect foraging habitat to the extent that it would affect suitability to peregrines.

All alternatives contribute to conservation of potential peregrine habitat (Forest Plan Objective 221). Alternative A would maintain current conditions. Alternatives B, C, D, and E would contribute more to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives would have no impact. Peregrine falcons currently do not occur in the Black Hills, and few breeding birds were historically supported here. Nesting habitat is very limited but stable. Designated routes would not affect the amount of nesting habitat. Foraging habitat is widely available and does not appear to be the limiting factor.

Yellow-Billed Cuckoo

Alternative A

Very little low-elevation riparian woodlands occur on the Forest; therefore, most motorized use would have little or no effect on the yellow-billed cuckoo. However, activities within or near low-elevation riparian areas could have effects.

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

If new user-created routs are created in riparian areas open to motorized cross-country travel, habitat could be adversely affected. Alternative A would continue to conserve riparian habitat

(Forest Plan Objective 221) but may be more challenging than the action alternatives if additional user-created routes are created in riparian areas open to motorized cross-country travel.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects on yellow-billed cuckoos would be similar to effects on riparian habitat. For disturbance effects in riparian habitat, see the general discussion of riparian habitat in General Effects to Wildlife and Habitat Components.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects on yellow-billed cuckoos would be similar to effects on riparian habitat. For disturbance effects in riparian habitat, see the general discussion of riparian habitat in General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of cuckoo habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals but are not likely to cause a trend to federal listing or loss of viability in the planning area. A small amount of low-elevation riparian areas occurs on the Forest and could provide habitat for yellow-billed cuckoos. All alternatives provide measures to conserve or enhance riparian areas; however, Alternatives B, C, D, and E generally reduce cross-country travel that could benefit the cuckoo. Alternative D would likely be more beneficial than the other alternatives due to the smallest motorized system and reduced cross-country travel. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for cuckoo habitat.

American Marten

Alternative A

Direct mortality from collisions is possible. Most collisions are likely to occur on paved highways and on existing gravel roads that allow higher vehicle speeds. There has been at least one report of a marten killed along a primitive road on the Forest. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. No new construction is planned as part of this alternative. Effects on downed woody material are expected to be minimal. This alternative does not authorize the removal of downed logs.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Disturbance in spruce habitat is expected to be similar to effects shown for spruce habitat in the general effects section (see General Effects to Wildlife and Habitat Components).

Fecske et al. (2003) identified high value marten habitat in the Black Hills. Alternative A would continue to allow unrestricted motorized cross-country travel in much of the high value marten habitat. Disturbance can be expected to continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts are expected to continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and would impact marten.

Alternative A would continue to allow motorized travel on 386 miles of routes in high value marten habitat. Some disturbance to marten would likely occur from these routes. Effects of motorized game retrieval and dispersed camping are expected to be similar to forestwide effects shown in the general discussion in General Effects to Wildlife and Habitat Components.

Alternative A would continue to contribute to the conservation of marten habitat (Forest Plan Objective 221), it could be more challenging if motorized cross-country travel leads to more user-created routes in marten habitat.

Effects Common to All Action Alternatives

Direct mortality from collisions is possible in all action alternatives. Most collisions are likely to occur on paved highways and on existing gravel roads that allow higher vehicle speeds. Collisions on new routes are expected to be minimal because most are trails with slower traffic. There has been at least one report of a marten killed along a primitive road on the Forest. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal. Effects on downed woody material are expected to be minimal. None of the action alternatives authorizes the removal of downed logs.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Disturbance in spruce habitat is expected to be similar to effects shown for spruce habitat in the general effects section (see General Effects to Wildlife and Habitat Components).

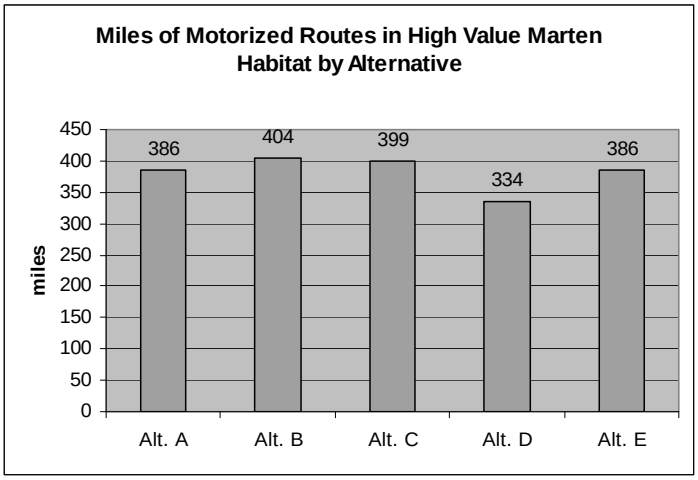

Figure 31. Miles of motorized routes in high-value marten habitat by alternative

None of the action alternative would allow unrestricted motorized cross-country travel. This is expected to have a

positive effect on marten by reducing disturbance impacts. Alternative B has the most motorized routes in high value marten habitat, followed by Alternatives C, E, and D, respectively. Still, the action alternatives are expected to have a net positive effect on marten due to the amount of habitat closed to motorized cross-country travel.

Effects of motorized game retrieval and dispersed camping are expected to be similar to forestwide effects shown in the general discussion in General Effects to Wildlife and Habitat Components.

Roads can cause habitat fragmentation for species that tend to use the interior parts of forest patches. More roads tend to reduce the patch size and increase the ratio of edge-to interior area. This reduces the amount of habitat available to species that prefer these interior forest conditions, such as marten (Reed et al. 1996). Forest Plan Standard 3215 directs us to maintain canopy closure in marten connectivity corridors to reduce fragmentation effects. All action alternatives are consistent with Standard 3215. There are no new routes proposed in Alternative E. Newly designated routes in Alternatives B, C, and D are primitive roads or trails that already exist on the ground. Designation of these routes would not reduce the canopy cover in the area.

All action alternatives contribute to conservation of marten habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals but would not cause a trend to federal listing or a loss of species viability range wide. Direct mortality of individuals has occurred from vehicle collisions, and would likely occur in the future. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines or objectives that provide for marten habitat. Alternatives B, C, D, and E may reduce impacts to marten by reducing areas open to cross-country travel.

Black-Tailed Prairie Dog

Alternative A

Direct mortality from collisions could occur in this alternative. Alternative A does not propose any new routes in prairie dog towns. Effects from collisions in this alternative are expected to be similar to existing conditions. Alternative A would continue to allow unrestricted motorized cross-country travel on most prairie dog towns. Motorized cross-country travel could lead to additional mortality.

Loss of habitat to road surface is expected to be minimal. Prairie dog towns are normally sparse in vegetation. Existing motorized game retrieval would continue in Alternative A. This is likely a minor effect since the occurrence of game retrieval on the 386 acres of prairie dog towns is likely low. Dispersed camping in prairie dog towns is expected to have a minor effect because the limited number prairie dog towns combined with their remoteness and sparse conditions do not normally promote frequent camping use.

Effects Common to All Action Alternatives

Direct mortality from collisions could occur in all action alternatives. Alternatives D and E do not propose any new routes in prairie dog towns. Effects from collisions in these alternatives are

expected to be similar to existing conditions. Alternative B and C would add about 300 yards of user-created route in one prairie dog town. This is not likely to result in a substantial increase in road-related mortality. Collisions are not expected to limit prairie dog populations in all action alternatives. Alternatives B, C, D, and E would close areas to motorized cross-country travel, resulting in a decrease in potential vehicle-caused mortality.

Loss of habitat to road surface is expected to be minimal. The 300 yards of new route designated in prairie dog towns in Alternative B and C already exist on the ground and would not result in new construction related habitat loss. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. Effects from disturbance are expected to be similar to those discussed for direct mortality above.

Existing motorized game retrieval would continue in Alternative B and C. This is likely a minor effect since the occurrence of game retrieval on the 386 acres of prairie dog towns is likely low. Dispersed camping in prairie dog towns is expected to have a minor effect in all action alternatives. The limited number prairie dog towns combined with their remoteness and sparse conditions do not normally promote frequent camping use.

All action alternatives contribute to conservation of prairie dog habitat (Forest Plan Objective 221). Alternatives B, C, D, and E are expected to contribute to the conservation of habitat by closing areas to cross-country travel. Alternatives D and E are expected to conserve habitat the most because they have the least amount of habitat with routes and cross-country travel. None of the action alternatives is expected to reduce the population below the (Forest Plan Objective 237) of 200 to 300 acres of prairie dog towns.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. Individuals could be affected by roads in prairie dog towns. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for prairie dog habitat.

Fringed Myotis

Alternative A

Direct mortality from collisions is expected to be minimal in all alternatives. Due to the maneuverability of this species and their hours of activity (nighttime), collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. No new routes are proposed with this alternative. New user-created routes could be created in areas where motorized cross-country travel is allowed and this could have a small negative effect on habitat.

The riparian ecosystem provides important foraging areas for this bat. For effects on riparian habitat, see the general riparian discussion in General Effects to Wildlife and Habitat Components.

The effects of disturbance in all alternatives are related to the ease of access provided to caves and mines used as roosts and hibernacula. Disturbance is expected to be similar to effects shown for wildlife in general discussed in General Effects to Wildlife and Habitat Components. Alternatives with the most area open to cross-country travel (Alternative A) would have the most potential for disturbance.

The cave ecosystem in general would be managed according to Objectives 109, 110, 112, and 113, and Standard 1401, as well as the Federal Cave Resources Protection Act of 1988. Ground disturbance would be avoided within 100 feet of natural cave openings (Standard 1401). Standard 3102 provides direction to protect caves and their microclimate when designing management activities where caves are important bat nursery or hibernacula sites.

Standard 3207 provides direction to avoid vegetative changes within 500 feet of caves and mines that serve as nursery roosts or hibernacula. Vegetative changes are expected to be minimal. No new construction is planned as part of this alternative. This alternative is consistent with Standard 3207.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species and their hours of activity (nighttime), collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal. Impacts to snag habitat is expected to be minimal for all action alternatives. None of the action alternatives would authorize the cutting or removing of snags.

The effects of disturbance in all action alternatives are related to the ease of access provided to caves and mines used as roosts and hibernacula. Disturbance is expected to be similar to effects shown for wildlife in general discussed in General Effects to Wildlife and Habitat Components. Alternatives with the most area open to cross-country travel would have the most potential for disturbance. Alternative D is expected to have the least disturbance.

For all action alternatives, the cave ecosystem in general would be managed according to Objectives 109, 110, 112, and 113, and Standard 1401, as well as the Federal Cave Resources Protection Act of 1988. Ground disturbance would be avoided within 100 feet of natural cave openings for all action alternatives (Standard 1401). Standard 3102 provides direction to protect caves and their microclimate when designing management activities where caves are important bat nursery or hibernacula sites.

Standard 3207 provides direction to avoid vegetative changes within 500 feet of caves and mines that serve as nursery roosts or hibernacula. Vegetative changes are expected to be minimal for all alternatives. Little new construction is planned as part of this project. Most newly designated routes are less than 50 inches in width and currently exist on the ground. All action alternatives are consistent with Standard 3207.

All action alternatives contribute to conservation of bat habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing. Individuals may be struck or disturbed by vehicles, though the potential is low. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for bat habitat. Fringed bats are likely to persist on the Forest because caves and mines would be managed to avoid disturbance and maintain conditions and riparian areas would be maintained or enhanced in all alternatives.

Rocky Mountain Bighorn Sheep

Alternative A

Direct mortality from collisions is possible. Most collisions are likely to occur on paved highways and on existing gravel roads that allow higher vehicle speeds. Collisions of new routes are expected to be minimal because most are trails with slower traffic. If new user-created routes are established in bighorn sheep use areas, it could impact vegetation and sheep habitat.

The effects of disturbance are estimated by using the miles of routes in bighorn sheep use areas and the acreage of use areas open to cross-country travel. Alternative A would continue to allow unrestricted motorized cross-country travel on 337 miles of routes in bighorn sheep use areas. Disturbance would be expected to continue occur in areas where motorized cross-country travel is allowed. Disturbance impacts would be expected to continue to accrue as motorized recreation use levels increase. User created routes would be expected to continue to be created and would impact bighorn sheep.

Effects of motorized game retrieval and dispersed camping are expected to be similar to those shown for wildlife in general in General Effects to Wildlife and Habitat Components.

Effects Common to All Action Alternatives

Direct mortality from collisions is possible in all action alternatives. Most collisions are likely to occur on paved highways and on existing gravel roads that allow higher vehicle speeds. Collisions of new routes are expected to be minimal because most are trails with slower traffic.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

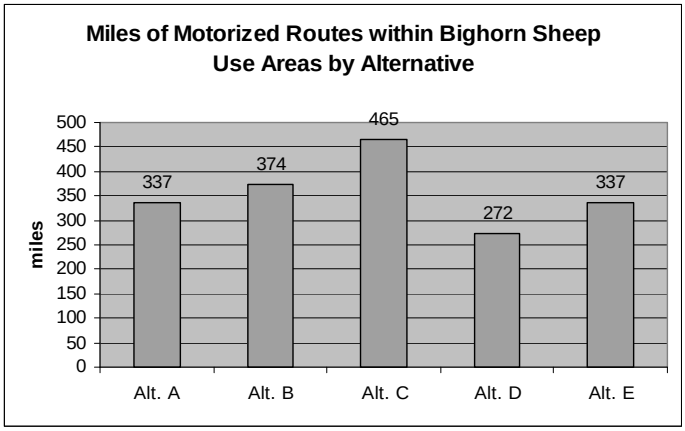

Figure 32. Miles of motorized routes within bighorn sheep use areas by alternative

The effects of disturbance are estimated by using the miles of routes in bighorn sheep use areas and the acreage of use areas open to cross-country travel. None of

the action alternative would allow unrestricted motorized cross-country travel. This is expected to have a positive effect on bighorn sheep by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative C has the most motorized routes in bighorn sheep use areas, followed by Alternatives B, E, and D, respectively. Still, the action alternatives are expected to have a net positive effect on bighorn sheep due to the amount of habitat closed to motorized cross-country travel.

Effects of motorized game retrieval and dispersed camping are expected to be similar to those shown for wildlife in general in General Effects to Wildlife and Habitat Components.

All action alternatives contribute to conservation of sheep habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel. Under all alternatives, there would be adequate habitat for maintaining bighorn sheep populations.

Determination and Rationale

All alternatives may adversely impact individuals, but are not likely to cause a trend to federal listing or loss of viability in the planning area. Individual sheep could be affected through vehicle collisions or disturbance. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines or objectives that provide for bighorn sheep habitat.

Townsend's Big-Eared Bat

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species and their hours of activity (nighttime), collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. No new routes are proposed with this alternative. New user-created routes could be created in areas where unrestricted motorized cross-country travel is allowed and this could have a small negative effect on habitat.

The riparian ecosystem provides important foraging areas for Townsend's big-eared bat. For effects on riparian habitat, see the general riparian discussion in General Effects to Wildlife and Habitat Components.

The effects of disturbance in all alternatives are related to the ease of access provided to caves and mines used as roosts and hibernacula. Disturbance is expected to be similar to effects shown for wildlife in general discussed in General Effects to Wildlife and Habitat Components. Alternatives with the most area open to cross-country travel (Alternative A) would have the most potential for disturbance.

The cave ecosystem in general would be managed according to Objectives 109, 110, 112, and 113, and Standard 1401, as well as the Federal Cave Resources Protection Act of 1988. Ground disturbance would be avoided within 100 feet of natural cave openings (Standard 1401). Standard 3102 provides direction to protect caves and their microclimate when designing management activities where caves are important bat nursery or hibernacula sites.

Standard 3207 provides direction to avoid vegetative changes within 500 feet of caves and mines that serve as nursery roosts or hibernacula. Vegetative changes are expected to be minimal. No new construction is planned as part of this alternative. This alternative is consistent with Standard 3207.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species and their hours of activity (nighttime), collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The riparian ecosystem provides important foraging areas for Townsend's big-eared bat. For effects on riparian habitat, see the general riparian discussion in General Effects to Wildlife and Habitat Components.

The effects of disturbance in all action alternatives are related to the ease of access provided to caves and mines used as roosts and hibernacula. Disturbance is expected to be similar to effects shown for wildlife in general in General Effects to Wildlife and Habitat Components. Alternatives with the most area open to cross-country travel (Alternative A) would have the most potential for disturbance. Alternative D is expected to have the least disturbance.

The effects of motorized game retrieval and dispersed camping are expected to be similar to those shown for general wildlife habitat in General Effects to Wildlife and Habitat Components.

For all action alternatives, the cave ecosystem in general would be managed according to Objectives 109, 110, 112, and 113, and Standard 1401, as well as the Federal Cave Resources Protection Act of 1988. Ground disturbance would be avoided within 100 feet of natural cave openings for all action alternatives (Standard 1401). Standard 3102 provide guidance to protect caves and their microclimate when designing management activities where caves are important bat nursery or hibernacula sites.

Standard 3207 provide direction concerning avoiding vegetative changes within 500 feet of caves and mines that serve as nursery roosts or hibernacula. Vegetative changes are expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are less than 50 inches in width and currently exist on the ground. All action alternatives are consistent with Standard 3207.

All action alternatives contribute to conservation of bat habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

Determination and Rationale

All alternatives may adversely impact individuals, but are neither likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. Individual bats could be affected by disturbance in all alternatives, though the potential is low. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not

change any of the standards, guidelines, or objectives that provide for bat habitat. Townsend's big-eared bats are likely to persist on the Forest because caves and mines would be managed to avoid disturbance and maintain conditions and riparian areas would be maintained or enhanced in all alternatives.

Species of Local Concern

Effects to most species of local concern are similar to effects shown in General Effects to Wildlife and Habitat Components discussed earlier in this document. Table 36 shows where effects to that species are discussed.

All alternatives are consistent with Forest Plan standards and guidelines pertaining to species of local concern. All alternatives contribute to the maintenance or improvement of habitat for species of local concern (Forest Plan Objective 221).

American Dipper

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

The Forestwide Travel Analysis Report (September 2007) identified relative risk to dippers for routes across the Forest. The routes identified with a high relative risk for dippers are used to evaluate effects.

Alternative A (existing condition) included some roads with a relative high risk for dippers. These roads would continue to be used and would continue to present a risk to dipper nesting and foraging. Alternative A also allows unrestricted cross-country travel on much of the Forest. Cross-country travel would allow continued access on many user-created routes near dipper streams, potentially providing additional impacts. The area open to motorized game retrieval and motorized dispersed camping would be the highest in Alternative A. These types of uses would affect dipper streams if they result in crossing streams to access game or campsites. Game retrieval would not affect nesting dippers because it occurs outside the nesting season, but could affect winter feeding activities.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The Forestwide Travel Analysis Report (September 2007) identified relative risk to dippers for routes across the Forest. The routes identified with a high relative risk for dippers are used to evaluate effects.

Table 36. Black Hills species of local concern and disposition of effects analysis

Species	Disposition
American Dipper (*Cinclus mexicanus*)	Evaluated below.
Black-and-White Warbler (*Mniotilta varia*)	Effects reflected in General Effects to Wildlife and Habitat Components, and Hardwood Habitat.
Broad-winged Hawk (*Buteo platypterus*)	Effects reflected in General Effects to Wildlife and Habitat Components, and Ponderosa Pine Habitat..
Cooper's Hawk (*Accipiter cooperii*)	Effects reflected in General Effects to Wildlife and Habitat Components, Riparian Habitat, Ponderosa Pine Habitat, and Hardwood Habitat.
Northern Saw-Whet Owl (*Aegolius acadicus*)	Effects reflected in General Effects to Wildlife and Habitat Components, Ponderosa Pine Habitat and Snag Habitat.
Pygmy Nuthatch (*Sitta pygmaea*)	Effects reflected in General Effects to Wildlife and Habitat Components, Ponderosa Pine Habitat, and Snag Habitat.
Sharp-shinned Hawk (*Accipiter striatus*)	Effects reflected in General Effects to Wildlife and Habitat Components, Spruce Habitat and Ponderosa Pine Habitat.
Bats (*Myotis evotis, Myotis volans, Myotis septentrionalis, Myotis ciliolabrum*)	Evaluated below.
Meadow Jumping Mouse (*Zapus hudsonius campestris*)	Effects reflected in General Effects to Wildlife and Habitat Components, Riparian Habitat.
Mountain Goat (*Oreamnos americanus*)	Evaluated below.
Northern Flying Squirrel (*Glaucomys sabrinus*)	Effects reflected in General Effects to Wildlife and Habitat Components, Ponderosa Pine Habitat, Snag Habitat and Spruce Habitat.
Butterflies Atlantis Fritillary (*Speyeria atlantis pahasapa*); Tawny Crescent (*Phycoides batesii*)	Effects reflected in General Effects to Wildlife and Habitat Components, Riparian Habitat, Hardwood Habitat and Grassland Habitat.
Snails (*Vertigo arthuri, Catinella gelida, Vertigo paradoxa, Discus shimekii*)	Effects reflected in General Effects to Wildlife and Habitat Components, Spruce Habitat, Ponderosa Pine Habitat, Hardwood Habitat, Riparian Habitat and Shrubland Habitat.

Implementation of standards and guidelines, watershed conservation practices, and State BMPs mitigate these impacts at the project level. These features mitigate impacts to nesting sites, foraging habitat and winter habitat by conserving soil, aquatic and riparian systems. The WCP Handbook contains proven watershed conservation practices to protect soil, aquatic, and riparian systems. They are incorporated verbatim into the Forest Plan as standards. The State BMPs carry the same weight as guidelines. Proper implementation of the WCP Handbook practices meets or exceeds State BMPs.

All alternatives contribute to conservation of dipper habitat (Forest plan Objective 221). Alternative A would maintain conditions similar to current conditions. Alternatives B, C, D, and E would contribute more to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. The action alternatives would not change any of the standards, guidelines, or objectives that provide for dipper habitat. This species is likely to persist under all alternatives because aquatic habitat conditions are maintained or enhanced through specific MA protection in Spearfish

Canyon and the implementation of standards and guidelines, watershed conservation practices, and State BMPs.

Alternative B

Alternative B would drop one route and add a couple of other routes (near Boulder Creek, Bear Butte Creek) with a relative high risk for dippers. More routes would be added than dropped, which could provide more impacts than Alternative A. Motorized game retrieval (elk) and dispersed camping would be allowed along some roads near dipper streams. Users would not be allowed to cross the nearby stream to access game or campsites, which would avoid impacts. Alternative B closes the Forest to unrestricted motorized cross-country travel, which would be a benefit to most dipper streams. Most user-created routes near dipper streams would no longer be used. Alternative B would have positive net effect on Dippers.

Alternative C

Effects of Alternative C would be the same as Alternative B, since the same routes with relative high dipper risk would be added and dropped, and unrestricted motorized cross-country travel would not be allowed. Motorized game retrieval is allowed in some areas of the Forest for deer and elk. Users would not be allowed to cross the nearby stream to access game or campsites, which would avoid impacts. Dispersed camping would be allowed along some routes near dipper streams. This could affect dippers if users cross dipper streams to access campsites. Still, the net effect of Alternative C would be positive due to the closure of most of the Forest to motorized cross-country travel.

Alternative D

Alternative D would have the least impact to dippers because it closes the most roads with a relative high dipper risk, does not add new routes with a relative high dipper risk, does not allow motorized game retrieval or dispersed camping off established routes, and closes the Forest to motorized cross-country travel. Some existing routes with a relative high dipper risk would remain open, so there would still be some level of effects. The net effect would be a positive one due to the closure of motorized cross-country travel, game retrieval and dispersed camping.

Alternative E

Alternative E would keep the existing road system similar to Alternative A, but would close the Forest to motorized cross-country travel and would not allow motorized game retrieval or dispersed camping off established routes. There would still be some effects from existing roads, but the net effect would be positive due to the reduction in motorized cross-country travel, game retrieval and dispersed camping.

Bats

Alternative A

Direct mortality from collisions is expected to be minimal. Due to the maneuverability of this species, collisions are possible, but unlikely. Also, bats are mostly active at night when motorized traffic is minimal. If collisions do occur, they are not likely to affect Forestwide populations.

All of the bats that are species of local concern use caves as part of their habitat requirement. The cave ecosystem in general would be managed according to Objectives 109, 110, 112, and 113, and Standard 1401, as well as the Federal Cave Resources Protection Act of 1988. Ground

disturbance would be avoided within 100 feet of natural cave openings for all alternatives (Standard 1401). Standard 3102 provide guidance to protect caves and their microclimate when designing management activities where caves are important bat nursery or hibernacula sites.

Standard 3207 provide direction to avoid vegetative changes within 500 feet of caves and mines that serve as nursery roosts or hibernacula. Vegetative changes are expected to be minimal for this alternative. No new routes are proposed in this alternative. This alternative is consistent with Standard 3207.

The Forest ecosystem is also important for bats, particularly the occurrence of snags. Effects on snags are expected to be minimal (see General Effects to Wildlife and Habitat Components, Snag Habitat).

The riparian ecosystem provides important foraging and watering areas for bats. For a discussion of effects on riparian habitat, see General Effects to Wildlife and Habitat Components, Riparian Habitat. Bats often forage in meadows and grassland areas. For a discussion of effects to grass/meadow habitat, see General Effects to Wildlife and Habitat Components, Grassland Habitat.

The effects of motorized game retrieval and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components. The effects of disturbance are related to the ease of access provided to caves and mines used as roosts and hibernacula. Disturbance is expected to be similar to effects shown for wildlife in general. Alternatives with the most area open to cross-country travel and the most motorized routes (Alternative A) would have the most potential for disturbance.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Due to the maneuverability of this species, collisions are possible, but unlikely. Also, bats are mostly active at night when motorized traffic is minimal. If collisions do occur, they are not likely to affect Forestwide populations.

All of the bats that are species of local concern use caves as part of their habitat requirement. For all action alternatives, the cave ecosystem in general would be managed according to Objectives 109, 110, 112, and 113, and Standard 1401, as well as the Federal Cave Resources Protection Act of 1988. Ground disturbance would be avoided within 100 feet of natural cave openings for all action alternatives (Standard 1401). Standard 3102 provide guidance to protect caves and their microclimate when designing management activities where caves are important bat nursery or hibernacula sites.

Standard 3207 provide direction to avoid vegetative changes within 500 feet of caves and mines that serve as nursery roosts or hibernacula. Vegetative changes are expected to be minimal for all action alternatives. Little new construction is planned as part of this project. Most newly designated routes are less than 50 inches in width and currently exist on the ground. All action alternatives are consistent with Standard 3207.

The Forest ecosystem is also important for bats, particularly the occurrence of snags. Effects on snags are expected to be minimal for all action alternatives (see General Effects to Wildlife and Habitat Components, Snag Habitat).

The riparian ecosystem provides important foraging and watering areas for bats. For a discussion of effects on riparian habitat, see General Effects to Wildlife and Habitat Components, Riparian Habitat. Bats often forage in meadows and grassland areas. For a discussion of effects to grass/meadow habitat, see General Effects to Wildlife and Habitat Components, Grassland Habitat.

The effects of motorized game retrieval and dispersed camping are expected to be similar to those discussed under General Effects to Wildlife and Habitat Components.

The effects of disturbance in all action alternatives are related to the ease of access provided to caves and mines used as roosts and hibernacula. Disturbance is expected to be similar to effects shown for wildlife in general. Alternatives with the most area open to cross-country travel and the most motorized routes would have the most potential for disturbance. None of the action alternatives would allow unrestricted motorized cross-country travel. Alternative D is expected to have the least potential for disturbance.

All action alternatives contribute to conservation of bat habitat (Forest Plan Objective 221). Alternatives B, C, D, and E would contribute a net benefit to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has the least amount of habitat with routes and cross-country travel.

The Forest Plan Phase II Amendment determined these species are likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for these species' habitat. These species are likely to persist on the Forest because all alternatives provide for roosting sites; the amount and availability of foraging areas is maintained; and potential cave hibernacula sites are protected.

Mountain Goat

Alternative A

Direct mortality from collisions is expected to be minimal. The core habitat areas are within Black Elk Wilderness and Norbeck Wildlife Preserve where motorized travel is not allowed. Goats that wander outside these areas could be hit by vehicles. If collisions do occur, they are not likely to affect Forestwide populations.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in mountain goat habitat.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to motorized cross-country travel. Alternative A would continue to allow unrestricted motorized cross-country travel mountain goat use areas. Disturbance would continue occur in areas where motorized cross-country travel is allowed. Disturbance impacts would continue to accrue as motorized recreation use levels increase. User created routes would continue to be created and would impact mountain goats. Motorized use of roads and trails can also disturb wildlife. Alternative A has the most motorized routes in mountain goat use areas (51 miles).

The effects of motorized game retrieval and dispersed camping are expected to be minimal. Most of the goat's main range is in areas where motorized game retrieval and dispersed camping would not be allowed (Black Elk Wilderness and Norbeck Wildlife Preserve). Outside these

areas, most game retrieval activities would occur during the big game season when goats are already being disturbed by deer and elk hunters on foot or on open routes.

Impacts to mountain goats are expected to be minimal for all alternatives due to their limited distribution and preference for high elevation rocky habitat.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. The core habitat areas are within Black Elk Wilderness and Norbeck Wildlife Preserve where motorized travel is not allowed. Goats that wander outside these areas could be hit by vehicles. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in the action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. None of the action alternative would allow unrestricted motorized cross-country travel. This would have a positive effect on mountain goats by reducing disturbance impacts.

Motorized use of roads and trails can also disturb wildlife. Alternative E has the most motorized routes in mountain goat use areas, followed by Alternatives B, C, and D, respectively. The action alternatives would have a net positive effect on mountain goats due to the amount of habitat closed to motorized cross-country travel.

The effects of motorized game retrieval and dispersed camping are expected to me minimal for all action alternatives. Most of the goat's main range is in areas where motorized game retrieval and dispersed camping would not be allowed in any alternative (Black Elk Wilderness and Norbeck Wildlife Preserve). Outside these areas, most game retrieval activities would occur during the big game season when goats are already being disturbed by deer and elk hunters on foot or on open routes.

Impacts to mountain goats are expected to be minimal for all action alternatives due to their limited distribution and preference for high elevation rocky habitat.

All action alternatives contribute to conservation of goat habitat (Forest plan Objective 221). Alternatives B, C, D, and E would contribute to the conservation of habitat by closing areas to cross-country travel. Alternative D would conserve habitat the most because it has

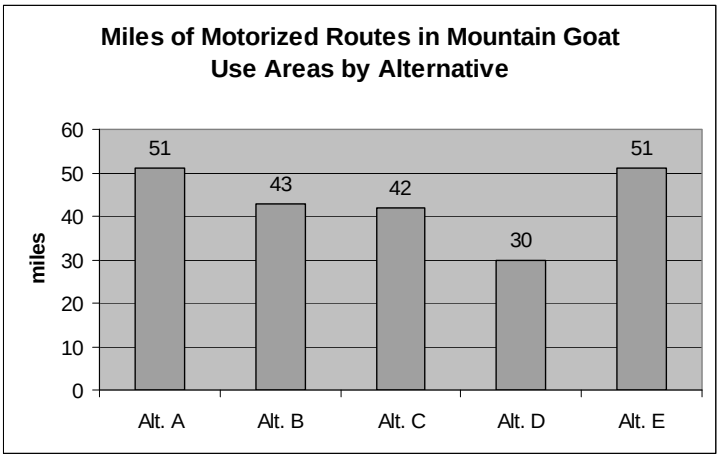

Figure 33. Miles of motorized routes in mountain goat use areas by alternative

the least amount of habitat with routes and cross-country travel.

The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest. This project would not change any of the standards, guidelines, or objectives that provide for mountain goat habitat. All action alternatives continue the current management of the Black Elk Wilderness and the Norbeck Wildlife Preserve.

Demand Species

Alternative A

Direct mortality from collisions is expected. Collisions are most likely to occur along existing highways and gravel roads that allow higher vehicle speeds. Collisions are less likely to occur on slower speed roads designated.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect vegetation in elk, mule deer, and turkey habitat.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. These species are found in most habitat types on the Forest. The effects of disturbance from routes, game retrieval, and dispersed camping are expected to be similar to those displayed under General Effects to Wildlife and Habitat Components.

Motorized game retrieval can affect the State game agencies' ability to manage elk and deer herds. It can influence how hunters disperse across the hunting units and affect the game agency's ability to meet herd objectives. Alternative A would have the most acreage open to motorized game retrieval which would offer the States the most flexibility in meeting herd objectives.

Executive Order 13443 (Facilitation of Hunting Heritage and Wildlife Conservation) directs the Department of Agriculture "to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat." Alternative A would result in little change to hunter access.

Effects Common to All Action Alternatives

Direct mortality from collisions is expected to be minimal in all action alternatives. Collisions are most likely to occur along existing highways and gravel roads that allow higher vehicle speeds. Collisions are less likely to occur on slower speed roads designated as part of this project. If collisions do occur, they are not likely to affect Forestwide populations.

Loss of habitat to road surface is expected to be minimal in the action alternatives. Little new construction is planned as part of this project. Most newly designated routes are 50 inches or less in width that existed previously but hadn't been formally designated. Effects on habitat condition and trend are expected to be minimal.

The effects of disturbance is estimated by using the miles of routes in suitable habitat and the acreage of habitat open to cross-country travel. These species are found in most habitat types on the Forest. The effects of disturbance from routes, game retrieval, and dispersed camping are expected to be similar to those displayed under General Effects to Wildlife and Habitat Components.

Motorized game retrieval can affect the State game agencies' ability to manage elk and deer herds. It can influence how hunters disperse across the hunting units and affect the game agency's ability to meet herd objectives. Of the action alternatives, Alternative C would have the most acreage open to motorized game retrieval, followed by Alternative B. Alternatives B and C may reduce the States' ability to manage elk and deer herds. Alternative C may concentrate hunting in those small portions of hunting units open to motorized game retrieval and reduce harvest in areas outside retrieval areas. Alternative B could lead to a focus on "road hunting" in order to get an elk near a road. Alternatives D and E could limit State's ability to manage herds the most since motorized retrieval of elk and deer would not be allowed off designated routes.

Motorized game retrieval may also affect hunter experience. Many hunters depend on their ATVs to retrieve harvested elk and deer. Hunters that depend on motorized game retrieval would experience a reduced opportunity to do so under Alternatives B and C, and a greater reduction in opportunity in Alternatives D and E. Alternatives D and E would provide more opportunities for hunters who desire a more primitive type of game retrieval (horse or foot).

None of the action alternatives would violate Executive Order 13443 and limit access to hunting areas due to the abundance of existing roads on the Forest that would remain open. The action alternatives would shift off-road hunting opportunities from motorized to nonmotorized by closing areas open to cross-country travel. Alternative D would shift elk and deer hunting opportunities the most from motorized hunting opportunities to more traditional nonmotorized hunting opportunities.

Migratory Birds

Golden eagles can occur throughout the Forest. Miles of motorized routes on the Forest and acres open to cross-country travel are used to estimate effects. Direct, indirect, and cumulative effects are expected to be similar to those shown under General Effects to Wildlife and Habitat Components. Swainson's Hawks, prairie falcons, upland sandpipers, and dickcissels typically occur in open grass dominated landscapes. Effects are expected to be similar to those displayed for grassland habitat (see General Effects to Wildlife and Habitat Components, Grassland Habitat). Black-billed cuckoos typically found in hardwoods at lower elevations. Effects are expected to be similar to those displayed for hardwood habitat (see General Effects to Wildlife and Habitat Components, Hardwood Habitat). Red-naped sapsuckers are generally associated with aspen stands. Effects are expected to be similar to those for aspen and hardwood habitat (see General Effects to Wildlife and Habitat Components, Hardwood Habitat).

Cumulative Effects

Past, Present and Reasonably Foreseeable Actions

Activities such as vegetation management, fuels management livestock grazing, recreational activities and other management activities have and would continue on the Forest. These activities would likely occur on private lands as well. The following specific types of activities are relevant to this analysis:

- Firewood cutting has occurred in the past and would likely continue on the Forest in the foreseeable future, consistent with Forest plan direction. Firewood cutting likely occurs and would likely continue on private lands in the Black Hills.
- Private landowners may treat forests for lumber or to reduce fire hazards, which could alter wildlife habitat.

- It is expected that urban development would continue on private lands.
- Management of national and state parks adjacent to the Forest would continue. These activities could impact habitat components.
- Prairie dog control efforts on private lands have occurred and can be expected to continue.
- Within the Forest area, a sizeable portion of the riparian habitat is under private ownership. Urban development is expected to continue on private lands.
- Road construction and maintenance and right-of-way brushing can be expected to continue on non-National Forest System land.
- Non-native predatory fish have been identified as a risk factor to leopard frog persistence.
- Road construction, reconstruction and decommissioning are expected to continue to move towards Forest Plan Objective 309.

Alternative A

Alternative A could have some incremental impacts to habitat quantity and quality because it would allow unrestricted motorized cross-country travel on much of the Forest. Motorized cross-country travel could lead to more user-created routes as the popularity of off-road vehicles increases. More user-created routes could further affect vegetation in addition to those activities mentioned above, which would effect wildlife and wildlife habitat inn general.

There could be some incremental impacts to all the activities mentioned above from disturbance. In Alternative A, incremental disturbance impacts would continue to accrue as motorized recreation use levels increase. User created routes would continue to be created and would incrementally disturb wildlife. This would apply to all habitats discussed above under direct and indirect effects.

Effects Common to All Action Alternatives

Firewood cutting has occurred in the past and would likely continue on the Forest in the foreseeable future, consistent with Forest plan direction. Firewood cutting likely occurs and would likely continue on private lands in the Black Hills. Since none of the action alternatives in this project authorize cutting of snags, no incremental impact on snags is expected from the action alternatives.

Privately owned forestlands within the Forest boundary also provide wildlife habitat. Resource management by companies and private citizens depends on a number of factors (e.g., desired goals, market prices, development potential) making it difficult to predict future trends. Landowners may treat forests for lumber or to reduce fire hazards, which could alter wildlife habitat. Urban development is expected to continue on private lands, which could lead to more roads and additional disturbance to wildlife. These activities may reduce suitable habitat wildlife, which could lead to some reduction in wildlife numbers in the Black Hills. This would likely increase the importance of habitat located on National Forest System land. The action alternatives are expected to offset some of the disturbance to wildlife from these activities on private lands by reducing motorized cross-country travel. The effect would be a net cumulative benefit from all action alternatives.

Management of national and state parks adjacent to the Forest would have an unknown effect on wildlife. National parks and monuments tend to manage for natural conditions, using fire and other processes, which would likely provide conditions under which hardwoods and other habitats evolved. Management in national and state parks would likely contribute to the

conservation of wildlife species. The incremental effects of the action alternatives would be additional benefits to wildlife and their habitat resulting from closing areas to motorized cross-country travel.

Prairie dog control efforts on private lands may negatively impact associated species. None of the action alternatives proposes new prairie dog control techniques. None of the action alternatives would increase recreational shooting of prairie dogs because all prairie dog towns are currently accessible by existing roads. The new route in Alternatives B and C would not increase the available areas for recreational shooting. Suitable habitats for prairie dogs and associated species would likely persist on the Forest; however, their occurrence would continue to be limited in distribution and abundance. There would be no incremental effects to prairie dog control.

Within the Forest area, a sizeable portion of the riparian habitat is under private ownership. Urban development is expected to continue on private lands. Thus, while the Forest would take actions under all action alternatives that would generally benefit species that use riparian habitat in the Black Hills (close areas to unrestricted motorized cross-country travel, close roads), actions by others may have an offsetting effect.

Road construction, maintenance and right-of-way brushing can be expected to continue on other ownership lands. Road maintenance may increase in Alternative B and C because route mileage would increase. Alternatives B and C could incremental adverse impacts on undiscovered snail colonies from route maintenance. Alternatives C and D maintain or reduce route mileage, which would have a net incremental benefit to undiscovered snail colonies from route maintenance.

Non-native predatory fish have been identified as a risk factor to leopard frog persistence. Increased access could lead to an increase in unauthorized fish stocking. The action alternatives would have a net positive incremental impact because reducing the area open to motorized cross-country travel would reduce the opportunity for unauthorized fish stocking.

Alternatives B, C, D, and E would reduce the amount of area open to cross-country travel, thereby reducing some of the effects of past, present and reasonably foreseeable activities on National Forest System lands and offsetting some impacts from other ownership lands. Incremental impacts from these alternatives are expected to be positive. Alternative D would reduce impacts the most by having the least amount of area open to cross-country travel and the least miles of motorized routes. This would be the case for all habitats discussed under direct and indirect effects.

Plants and Botanical Resources

Introduction

The Black Hills is recognized as a unique ecoregion among 64 terrestrial ecoregions in the continental United States (Hall et al. 2002), encompassing an area of 5,121 square miles (roughly 3 million acres). The varied topography, geology, and climate result in a corresponding variety in plant communities, which included diverse elements such as western ponderosa pine forests, grasslands of the Great Plains, and northern white spruce forests.

The Black Hills are also characterized by Midwest hardwood types, which are well represented by stands dominated by oak, ash, and elm. The Black Hills Community Inventory was the first systematic classification to describe the vegetation of the Black Hills by tiering to the

standardized National Vegetation Classification (Marriott et al. 1999, Marriott and Faber-Langendoen 2000). Although further refinement of the Black Hills Community Inventory is needed, approximately 70 native plant communities have been described in the Black Hills ecoregion.

The native plant communities of the Black Hills ecoregion are composed of a great diversity of plant species. The Black Hills has floristic influences from four of the North American biomes: Cordilleran Forest, Grassland, Eastern Deciduous Forest, and Northern Coniferous Forest. While approximately 30 percent of the plant taxa in the Black Hills have their main ranges to the west; midwestern, eastern, and northern taxa are also significantly represented in the Black Hills flora (McIntosh 1931). The Forest designated eight Management Area 3.1 Botanical Areas in 1997 to help guide forest management in conserving areas of high botanical diversity, primarily at the plant community level.

The majority of the plant species of concern (including R2 sensitive species and plant species of local concern) in the Black Hills are best described as boreal disjuncts (species that were isolated in the cooler, moister forests and riparian areas of the Black Hills as glaciers retreated and the Great Plains environment became established). The closest populations of these species to occurrences in the Black Hills are generally found in Canada and the northeastern United States.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Forest Plan Objectives, Standards, and Guidelines. The following Forest Plan objectives, standards, and guidelines provide direction for management of botanical resources, plant species and their habitat on the Black Hills National Forest. Due to the extensive number of objectives, standards and guidelines that are applicable to management of botanical resources, the details of each are not provided here. Please refer to the Wildlife specialist report or the Forest Plan for more information.

Objectives: 105, 204, 221, 213, and 216

Standards: 1301, 3106 (a-d), 3115, 3.1-2502, 3.1-2101, 3.1-9102, and 3.1-9104

Guidelines: 4102a and 9108

The Forest Plan tiers to the FS Handbook 2509.25 - Watershed Conservation Practices Handbook. The following Management Measures are applicable to this analysis:

- Management Measure (3)
- Management Measure (6)
- Management Measure (9)
- Management Measure (10)
- Management Measure (11)

Methodology

The analysis of the effects of the proposed action and alternatives on plant species of concern (this includes threatened and endangered species, Region 2 sensitive species, and Black Hills National Forest plant species of local concern), special emphasis areas including M.A. 3.1 Botanical Areas, and wetland/fen areas was based on the best available science and data. Sources of information include attributes contained in GIS concerning relationships between

roads and areas of concern (i.e., known plant occurrences, MA 3.1 Botanical Areas and known wetland/fen locations); botanical survey data collected over the years; and personal knowledge by resource specialists.

Indicators

Based on the issues identified in Chapter 1, the following indicators were used to measure the difference between the alternatives:

- Miles of routes through suitable plant habitat types
- Miles of motorized routes
- Acres open to motorized cross-country travel
- Routes that intersect known occurrences of R2 sensitive plant species, Black Hills National Forest plant species of local concern, Management Area 3.1 Botanical Areas, and/or wetland/fen areas
- Miles of new proposed roads and trails
- Acres of proposed trailheads

Assumptions

The effects analysis was based on the following assumptions. Under any of the action alternatives:

- The public would observe and comply with the proposed transportation system. Specifically, motorized users would use only motorized routes designated and would refrain from using routes not designated.
- Motorized game retrieval and dispersed camping activities do not enter into or cross perennial streams/wetlands.
- More areas open for motorized game retrieval would generally be expected to generate more use of these areas.
- Administrative access is allowed for official Forest business including contractors and permit holders.
- Concentrating vehicle use to reduce effects on routes and areas not designated will increase use and possibly effects on routes and areas that are designated.
- There is a possibility that unknown plant occurrences may occur in unsurveyed areas, routes in these areas will be designed to avoid impacts to any discovered occurrences.
- Monitoring of plant occurrences will occur and any discovered impacts will be mitigated.

Design Criteria

As indicated in the table below, thirteen proposed routes intersect known occurrences of R2 sensitive plant species, plant species of local concern, M.A. 3.1 Botanical Areas, and/or fen areas. These routes must be designed or rerouted to avoid impacting the resource.

Table 37. Routes requiring design criteria, removal or rerouting to avoid impacts to special status plant species or areas

Species	Occurrence	Route Number	Alt B	Alt C	Alt D
Routes to be designed, removed, or rerouted to avoid impacts to R2 sensitive species					
Bearlodge RD					
Botrychium campestre	BOCA5-8	872.3		X	
Botrychium lineare	BOLI7-1	864.1 (outside Dugout Gulch Botanical Area)	X	X	
Carex alopecoidea	CAAL8-12	U71002	X		
	CAAL8-31	841.1L	X	X	
Cypripedium parviflorum	CYPA19-10	863.2C	X	X	
Viburnum opulus var. *americanum*	VIOPA2-2, VIOPA2-16	864.1 (in Dugout Gulch Botanical Area)	X	X	
	03DUG3A, 94S460B	U650017	X	X	
Northern Hills RD					
Carex alopecoidea	CAAL8-22	U710024		X	
Cypripedium parviflorum	950070B	U080045	X	X	X
Platanthera orbiculata	01G040	CZ0418 U010076	X	X	
	PLOR4-18	U010071	X	X	
Sanguinaria canadensis	SACA13-2	567.1F	X	X	X
	SACA13-2	172.1A	X	X	X
Viburnum opulus var. *americanum*	VIOPA2-4	U080156	X	X	
	980010	CZ4846	X	X	
Mystic RD					
Cypripedium parviflorum	CYPA19-2	CZ1790	X	X	X
Routes requiring design criteria to avoid impacts to Black Hills NF plant SOLC					
Mystic RD					
Gentiana affinis	07M008A	CZ4927		X	
Hell Canyon RD					
Gentiana affinis	GEAF-4	HC9	X	X	
	07B040A	CZ3526	X	X	
	07B042	HC1	X	X	
Routes requiring design criteria to avoid impacts to M.A. 3.1 Botanical Areas					
Bearlodge RD					
Dugout Gulch Botanical Area		864.1C	X	X	
		864.1	X	X	
		864.1A	X		
Routes requiring design criteria to avoid impacts to fens					
Mystic RD					
South Fork Castle Creek fen		385.1A	X	X	X
Newton Fork fen		304.1L	X	X	X

Field Surveys

All botanical survey data on Forest were considered for this project. Forestwide survey specifically for R2 sensitive species has occurred since 2001, although the list of R2 sensitive species was revised in 2003, 2005, and 2007 (USDA Forest Service 2007c). The information gathered from these surveys provided information on distribution and habitat associations for species. A great deal of effort has also been put into botanical survey since 2000 to support design of management activities and projects that are protective of plant species of concern (including R2 sensitive plant species and Forest plant species of local concern).

The focus of these surveys was on identifying and mapping community types and determining the probability of an area to support target plant species in addition to locating and recording individual target plant species. These surveys required that 100 percent of highly probably plant habitat be surveyed along with at least 10 percent of the areas considered to be of lower probable habitat using varying degrees of survey intensities. Areas to survey were stratified using a combination of the Hillshade[5] model, aerial photographs, topographic maps, local knowledge, and professional judgment during field reconnaissance. All botanical survey data is stored in the Forest Database and GIS (USDA Forest Service 2008).

Affected Environment

Not all new proposed roads and trails (including new routes, opening closed roads and proposed trailheads) have been completely surveyed at this time. Per Forest Service Manual direction (USDA Forest Service 2007c), presence of species of concern is assumed in areas where inventory methods are not feasible (due to time and seasonal constraints in this case) and the expected effects analyzed is based on that assumption. The evaluation of effects presented is based on survey of 79 to 83 percent of the proposed routes and 57 to 63 percent of the proposed trailheads.

Riparian, Wetland, and Fen Habitat

All wetlands (including riparian areas, wet meadows, fens, lakes, seeps, springs, etc.) are important to vegetation and other natural resources.

Riparian habitat is defined as being located along the edges of streams. It is the transition zone between aquatic habitat and upland terrestrial habitat. There are about 76,900 acres of riparian habitat on the Forest (USDA Forest Service 2005a). Riparian areas include meadows, although not all riparian areas are classified as meadows. Much of the riparian habitat on the Forest is open to cross-country travel and approximately 2,050 miles of motorized routes are within 400 feet of riparian areas.

Wetlands (including riparian areas, fens, seeps, and springs) are habitat for many plant species of concern in the Black Hills (including R2 sensitive plant species and Forest plant SOLC). In the arid western U.S., wetland areas make up a small proportion of the landscape but are critical to maintaining ecosystems on a large scale. An accurate estimate of location, quantity, and quality of wetlands at the Forest level is not currently available.

[5] Over the past several years, the Hillshade model has been field verified and has proven to be very helpful in predicting high probability target plant habitat in some parts of the Black Hills. Hillshade uses the length of time and intensity of the sun in relation to topography to predict shade and therefore moisture content across the landscape. It has been observed in some parts of the Black Hills that moisture is one factor driving the presence of high probability target plant habitat for many target plant species.

Fens are a rare kind of wetland that is dependent on an unfailing groundwater supply. The organic layer (peat) takes thousands of years to form and is considered an irreplaceable resource because the formation process is so slow. The Forest is currently inventorying fen resources in collaboration with experts from Colorado State University.

White Spruce Habitat

The Black Hills has one of the southern-most populations of white spruce (*Picea glauca*) in the United States. White spruce is the most shade-tolerant of the Black Hills tree species, enabling regeneration and growth under closed canopy conditions. The cool, moist environments of white spruce stands provide habitat diversity in a ponderosa pine-dominated landscape. Several R2 sensitive and Forest plant species of local concern are found in spruce communities. Spruce habitat currently occupies about 26,500 acres on the Forest (USDA Forest Service 2007b). Much of the spruce habitat is currently open to cross-country travel and approximately 100 miles of motorized routes are in spruce habitat.

Hardwood Habitat

Paper birch/hazel forest (*Betula papyrifera/Corylus cornuta* forest) occurs in drainage bottoms with and without streams and on northerly slopes. In the northern Black Hills where precipitation is higher and temperatures are cooler, paper birch/hazel forest extends to lower elevations. Stands are found in mesic (moist) habitat such as shaded, narrow gulches and north-facing slopes. Paper birch/hazel forest often transitions into bur oak/ironwood forest in Black Hills drainages at lower elevations. A number of boreal disjunct plant species, including some R2 sensitive and Forest plant species of local concern occur in stands of cool, moist paper birch/ hazel forest and bur oak/ironwood forest. The current condition for hardwoods and associated motorized recreation is shown in the table below.

Table 38. Current conditions for hardwoods and associated motorized recreation

Hardwood Cover-type	Current Acres on the Forest*	Miles of Currently Open Motorized Routes within Habitat
Aspen	45,560	150
Bur Oak	12,879	22
Paper Birch	3,212	6
Other Hardwoods	970	1
Total	62,621	179

*(USDA Forest Service 2007b)

Threatened and Endangered Species

No federally endangered, threatened, proposed or candidate species plant species are known to occur on the Forest (USDI Fish & Wildlife Service 2007a & USDA Forest Service 2007b)

Region 2 Sensitive Species

Region 2 sensitive species are those plant and animal species identified by the Regional Forester for which population viability is currently of concern, as evidenced by significant current or predicted downward trends in population numbers or density, or by significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (USDA Forest Service 2007c). The following is a list of plant species designated as sensitive species in Region 2 of the United States Forest Service (USDA Forest Service 2007c) that are known or likely to occur on the Black Hills National Forest.

Prairie Moonwort (*Botrychium campestre*) - *Botrychium campestre* ranges from the Great Lakes, across Iowa and Nebraska to eastern Colorado and northward to Alberta and Saskatchewan. Seven occurrences have been confirmed on Forest. Additional sites exist on private land and at Wind Cave National Park. Rangewide, *Botrychium campestr*e occurs primarily on well-drained soils in non-forested habitats, occasionally under shrubs in or at the margins of these habitats. It is considered a grassland species associated with sandy grassland habitats in prairies, dunes, railroad sidings, and fields over limestone. *Botrychium campestre* is extremely inconspicuous and is visible, at most, a few weeks during the year. Black Hills sites occur on substrates with at least some component of limestone and are primarily in open grassland habitats, usually with high forb diversity and sometimes with a high percentage of bare and rocky soils. Little bluestem (*Schizachyrium scoparium*) and western snowberry (*Symphoricarpos occidentalis*) occur at the majority of sites. Black Hills occurrences range in elevation from 3,870 to 5,640 ft.

Slender Moonwort *(Botrychium lineare)* - *Botrychium lineare* is historically known from California and Utah and currently from Colorado northward to Washington, Montana, Alaska and the Yukon Territory. Five occurrences have been confirmed on Forest. Western populations of *Botrychium lineare* occur primarily on limestone substrates in a variety of habitats including heavily forested sites and grassy meadows, fen-like seeps and gravelly roadsides. All sites occur in open conditions on limestone substrate. Two sites are located on old (estimated 15 to 25 years) native surface roadbeds. A third site is located adjacent to a gravel roadbed in open grassland. The fourth site, located on a large, open, north-facing, little bluestem dominated hillside, is not associated with any road development. The fifth site, also not associated with any road development, is located in an open, forb-dominated area on the bank of a small perennial stream. Elsewhere in its range, this species has often been documented in areas of road disturbances and other human and natural disturbances. Black Hills occurrences range in elevation from 4,200 feet (in Wind Cave National Park) to 6,160 feet.

Foxtail Sedge *(Carex alopecoidea)* - *Carex alopecoidea* is widely distributed from eastern to central Canada, the northeastern United States, the Great Lakes region south to Tennessee, and west to North Dakota and the Black Hills of South Dakota and Wyoming. Rangewide, habitat includes seasonally saturated meadows and openings in alluvial woods and stream banks, usually over calcareous substrates. In the Black Hills, *Carex alopecoidea* is currently known from two general areas: The Cement Ridge area along the South Dakota–Wyoming border, and in the Bear Lodge Mountains in Wyoming. There are approximately 30 occurrences on Forest. *Carex alopecoidea* is primarily found along open, perennial streams, often with old beaver dams or ponds. Occurrences have also been found in spruce-dominated riparian areas and in drainages with dense shrub cover. Plants are primarily documented in the transitional areas between saturated soils and the more mesic upland areas. Black Hills occurrences range in elevation from 3,840 to 5,900 feet.

Lesser Yellow Lady's Slipper *(Cypripedium parviflorum)* is primarily circumboreal in distribution and rangewide is generally found in shady deciduous and mixed woodlands near streams, shrublands, swamps, bogs, and wet forests. There are approximately 50 occurrences on Forest. Habitat in the Black Hills includes streambanks under both spruce and deciduous overstories, moist cliffs (usually north facing), and moist areas/seeps under white spruce or mixed conifer forest. Occasionally, *Cypripedium parviflorum* is found on upper mesic forest slopes. Black Hills occurrences range in elevation from 3,500 to 6,500 feet.

Stream Orchid *(Epipactis gigantean)* occurs in western North America from British Colombia south to California, and east to Texas. In the colder northern portions of its range, *E. gigantea* may be confined to warm springs habitats (Hornbeck et al. 2003). In South Dakota, it is only known from one occurrence on private and Forest land along Cascade Creek in Fall River County, South Dakota. Rangewide, *Epipactis gigantea* is known from wet meadows, seepage slopes, and the base of cliffs along streams and rivers. In South Dakota and in the Black Hills, it is known only along Cascade Creek at 3,400 ft. It is likely dependent upon the constant moisture and warmth provided by the springs. No other warm springs are known on Forest.

Trailing Clubmoss *(Lycopodium complanatum)* is circumboreal and common across northern latitudes but disjunct or sparse at the southern limits of the species' distribution, such as in the Black Hills. Rangewide, *L. complanatum* is restricted to moist (not saturated) microhabitats within boreal plant communities in ravines, steep drainages, and on moist streamside benches. These occurrences are located in the northern Black Hills on shaded, north-facing, White spruce dominated slopes often with paper birch or quaking aspen (*Populus tremuloides*). Black Hills occurrences range in elevation from 4,960 to 6,340 feet.

Lesser Roundleaved Orchid *(Platanthera orbiculata)* is endemic to the boreal regions of northern North America, with a more southern distribution in the eastern United States. There are approximately 30 occurrences known in the Forest. Black Hills occurrences are found primarily on shady, north-facing slopes in paper birch/hazel or white spruce forests on moist, rich, humus soil. Occurrences in the Black Hills range in elevation from 4,350 to 6,150 feet.

Sage Willow *(Salix candida)* occurs from eastern Canada to Alaska and across the northern United States. There is one known occurrence in the Black Hills in McIntosh Fen Botanical Area. There is also a historical collection for the general area "from Loring Siding to Minnekahta" (unknown if the historical collection is from private or FS land). Rangewide, *S. candida* is an obligate wetland species. The one verified extant occurrence on the Black Hills is at 6,000 feet. Habitat includes cold seep or spring-fed saturated substrates produced by unusual hydrologic conditions where sedimentary layers of the Limestone Plateau intersect impermeable schist or shale of the crystalline Central Core. The plant community type associated with the occurrence is wet meadow and fen.

Autumn Willow *(Salix serissima)* occurs primarily in northern boreal bogs and fens throughout its range and is a disjunct relic in the Black Hills. There are four known occurrences on Forest. Rangewide, *S. serissima* occurs in fens and wet meadows often dominated by *Carex* species and other *Salix* species. In the Black Hills, *S. serissima* occurs in the same unique hydrologic conditions as *Salix candida*: wet meadows and fens on cold seep or spring-fed saturated substrates produced by unusual hydrologic conditions where sedimentary layers of the Limestone Plateau intersect impermeable schist or shale of the crystalline Central Core. Black Hills occurrences range in elevation from 5,620 to 6,000 feet.

Bloodroot *(Sanguinaria canadensis)* occurs in moist forests from Nova Scotia south to Florida and west to Manitoba and Kansas. The currently known range in the Black Hills is limited to the northeast portion of the Black Hills, from the east side of Spearfish Canyon to west of Tilford. There are approximately 20 occurrences in the Black Hills. Rangewide, *S. canadensis* occurs in moist forests. In the Black Hills, it occupies floodplains, forested terraces, drainage bottoms, and north-facing footslopes in open, rich hardwood areas usually comprised of paper birch/hazel forest or bur oak/ironwood forest (*Quercus macrocarpa/Ostrya virginiana* forest). Black Hills occurrences range in elevation from 3,940 to 5,000 feet.

Highbush Cranberry *(Viburnum opulus* var. *americanum)* is widely distributed across north central North America. There are approximately 30 occurrences in the Black Hills. *V. opulus* var. *americanum* occurs in the Black Hills at mid-elevations in wet, shaded habitats along streams, springs and canyon bottoms. Most of the documented occurrences are in drainage bottoms or low slopes with moist soil conditions with partial shading. Currently known sites are primarily associated with paper birch and ironwood communities, with or without white spruce or quaking aspen. A few sites are found in ponderosa pine/bur oak Forest (*Pinus ponderosa*/*Quercus macrocarpa* Forest). Paper birch is present at almost all currently known sites. Black Hills occurrences range in elevation from 3,800 to 5,700 feet.

Selkirk's Violet *(Viola selkirkii)* is a circumboreal herbaceous species and rangewide it is locally abundant in specialized microsites in coniferous and deciduous forests. There are thirteen known occurrences on Forest with additional occurrences documented from Custer State Park and Mt. Rushmore National Monument. All currently known occurrences on FS lands are located within the Black Elk Wilderness and/or the Norbeck Wildlife Preserve. Black Hills occurrences are restricted to a concentrated area (ca. 36 square miles) of the central core on igneous or metamorphic bedrock. Microhabitats are often moist, cold air drainages, in shaded to open areas, and often in the vicinity of granitic rock outcrops. White spruce is usually the dominant overstory with a variable understory. Black Hills occurrences range in elevation from 5,240 to 7,000 feet.

Plant Species of Local Concern

Species of local concern are plant, fish, and wildlife species (including subspecies or varieties) that do not meet the criteria for sensitive status. These could include species with declining trends in only a portion of Region 2, or those that are important components of diversity in a local area. The local area is defined as NFS lands within the Forest. (FSM 2620.5 Black Hills Supplement 2600-2005-1). All Forest plant species of local concern were considered in this analysis. The following is a list of plant species of local concern on the Black Hills National Forest.

Southern Maidenhair Fern (*Adiantum capillus-veneris*) occurs primarily in tropical and warm temperate regions of the world. In North America, it is mainly distributed across the southern third of the U.S. with disjunct northern occurrences (such as the Black Hills) restricted to moist, calcareous substrates closely associated with warm or hot springs. The single documented Black Hills occurrence is associated with warm springs at Cascade Creek (elevation 3,150-3,450 ft.) in the southwestern Black Hills (Fall River County, South Dakota). Plants at Cascade Creek are found in moist to saturated areas on the streambank and in depressions and old channels on the adjacent floodplain. No other warm springs are known on FS administered land in the Black Hills.

Leathery Grapefern *(Botrychium multifidum)* is found across Canada and along the coast of Alaska, and in Greenland, Europe, and northwest Asia. It is found across the northern tier of states in the U.S.; south to California, Nevada, and Utah in the west; and south to Virginia in the east. Rangewide, *B. multifidum* grows in moist, open or shaded areas, including old pastures, meadows, woodland margins, riverbanks and bottom lands. Eight known occurrences on Forest lands. Most of the know locations are in mossy, mesic sites dominated by white spruce or mixed spruce-pine along small, perennial streams. Plants occur in open to shady areas, often in or near old stream channels where water is no longer flowing on a permanent basis. Seven of the eight occurrences are located in a concentrated area (ca. 16 square miles) of the central core on igneous or metamorphic bedrock, within the Black Elk Wilderness and/or Norbeck Wildlife

Preserve. One exception is a single site in the Bear Lodge Mountains (WY) in a steep narrow drainage with paper birch/hazelnut community on sandstone. Plants at the Bear Lodge site are found on moss-covered sandstone boulders and streambank berms near occasional pools of water. Plants have also been found in duff under spruce, in grassy margins along streams, on sand/gravel bars along streams, and in mesic soils near hiking trails. Black Hills occurrences range in elevation from 4,620 to 6,450 feet.

Southwestern Showy Sedge (*Carex bella*) has its primary range in the southwest U.S. and Mexico. Rangewide this species typically inhabits streambanks, meadows and moist woods or open slopes, frequently above timberline. Black Hills occurrences (8 reported; 3 on Forest lands and 5 in Custer State Park) are known from high elevations of the central granitic core in cool, moist, shaded white spruce forests often with paper birch and usually associated with large granite rock outcrops. The three occurrences on Forest are in a one square mile area within the Black Elk Wilderness. Black Hills occurrences range in elevation from 6,600 to 7,100 feet.

Beaked Spikerush (*Eleocharis rostellata*) occurs in coastal salt marshes and in inland saline, alkaline, or strongly calcareous wetland habitats (e.g., around hot springs). The single documented Black Hills occurrence is on calcareous substrates in the year-round flows of warm spring water of Cascade Creek in the southwestern Black Hills, at an elevation of 3,150 to 3,450 feet.

Pleated Gentian (*Gentiana affinis*) is known from western North America, primarily in moist meadows in mountainous or hilly areas. Approximately 30 occurrences are known on Forest, primarily from botanical surveys in 2006 and 2007. Forest occurrences are reported primarily from the central to western Black Hills in a wide range of habitats. Black Hills occurrences have been documented in moist areas near stream margins, springs and fens, montane grasslands, vegetated drainages with cobbles and conifer dominated slopes. Elevation of occurrences range from 4,960 to 6,620 feet. Occurrences are known in McIntosh Fen and Black Fox Botanical Areas.

Broadlipped Twayblade (*Listera convallarioides*) occurs on rich humus in open woods and boggy meadows and prefers cool soil. It is considered a facultative wetland species in South Dakota and eastern Wyoming and has a high tolerance for anaerobic conditions. There is four known occurrences on Forest lands, all of which are restricted to a 20 square mile area in the northern Black Hills. Elevations range from 5,120 to 6,080 feet. Individuals are growing in saturated soil conditions adjacent to creeks and springs, in white spruce dominated forests. One occurrence is in Englewood Springs Botanical Area.

Stiff Clubmoss (*Lycopodium annotinum*) is widely distributed in boreal habitats of North America. Elsewhere in its range, it occurs in swampy or moist coniferous forests, mountain forests, and exposed grassy or rocky sites. There are 10 known occurrences on Forest. Sites occur primarily in the northern Black Hills and are associated with moist microhabitats within remnant boreal white spruce and paper birch/hazelnut communities. Three occurrences are co-located with *Lycopodium complanatum* (R2 sensitive species) and two are in the Upper Sand Creek Botanical Area. Black Hills occurrences range in elevation from 5,100 to 6,300 feet.

Alpine Mountainsorrel (*Oxyria digyna*) is widely distributed in arctic and alpine regions of North America and across the western U.S. Associated habitats include rocky areas in mountains, especially near streams, and moist ground in alpine or subalpine areas. The three known occurrences on Forest lands are restricted to the central granitic core of the Black Hills, in a concise area (ca. two square miles) within the Black Elk Wilderness. One additional occurrence

is reported from Custer State Park. Plants occur on coarse-textured soils near steep, granite rock outcrops often in rocky gullies. Plants co-occur with *Carex bella* (species of local concern) and/or *Viola selkirkii* (R2 sensitive species) at some sites. Black Hills occurrences range in elevation from 6,000 to 7,240 feet.

Arrowleaf Sweet Coltsfoot (*Petasites sagittatus*) is known from Labrador to Alaska, south to Wisconsin, Minnesota, South Dakota (Black Hills), Colorado, Idaho, and Washington. There are 15 fairly recent reports (1999-2007) of occurrences on Forest. Rangewide, *P. sagittatus* is associated with cold, wet, marshy conditions and is a facultative wetland species. Black Hills occurrences are reported from moist to saturated wetland areas along drainages and seeps in conditions ranging from full sun to deep shade under spruce (often with birch or aspen). One occurrence is in Black Fox Botanical Area. Black Hills occurrences range in elevation from 5,120 to 6,600 feet.

Northern Hollyfern (*Polystichum lonchitis)* is a circumboreal, subalpine forest fern that occurs in rock crevices and at the base of boulders, mostly in boreal and subalpine coniferous forests or alpine regions. Twenty known occurrences are reported from Forest lands in the northern Black Hills and Bear Lodge Mountain. *P. lonchitis* is disjunct in the Black Hills from western Wyoming. Black Hills occurrences are associated with moist, often mossy, shaded to partially shaded, northerly-facing slopes, ravines and gulches on primarily limestone substrates. Dominant overstory is birch/hazelnut, sometimes with spruce, ironwood or aspen and often with diverse shrub and forb components. Black Hills occurrences range in elevation from 4,280 to 6,040 feet.

Shining Willow (*Salix lucida* ssp. *caudate*) is widely distributed in the western and northern U.S. and Canada. It is at the eastern limit of its range in South Dakota. Rangewide, *S. lucida* ssp. *caudata* is commonly associated with streambanks, shores, wet meadows, and seeps. The taxon is considered a facultative wetland plant in South Dakota and eastern Wyoming. Two Forest occurrences were confirmed in 2006—one along a small creek in the Bear Lodge Mountains at 4,800 feet (1 original plant and 5 planted from cuttings), and the other is in the northern Black Hills at 5,000 feet (2 plants). A third location documented by confirmed voucher, has not yet been relocated, and a fourth location was planted from cuttings in 2007 (19 plants).

Management Area 3.1 Botanical Areas

The Forest designated eight areas as Management Area 3.1 Botanical Areas in the 1997 Forest Plan: Black Fox, Bear/Beaver Gulches, Dugout Gulch, Englewood Springs, Higgins Gulch, McIntosh Fen, North Fork Castle Creek, and Upper Sand Creek. These areas are comprised of plant communities, associations, and individual plant species of particular quality and interest. M.A. 3.1 Botanical Areas comprise about 1 percent of the Forest and the focus of management is to maintain their botanical features and support public use for educational purposes. M.A. 3.1 Botanical Areas provide habitat for R2 sensitive species, Forest plant SOLC, and other elements of biological diversity. They also provide scenic and other public property values.

Environmental Effects Analysis

Direct and Indirect Effects Common to All R2 Sensitive and Forest Plant Species of Local Concern

Impacts and risks to species on the Forest were estimated based on the best available science and data. Species persistence for R2 sensitive plant species and Forest plant species of local concern was evaluated in the Phase II Forest Plan Amendment. Each alternative in this project was

evaluated as to whether it is consistent with Forest Plan standards and guidelines applicable to each species.

The construction and use of roads and trails generally have a negative effect on plant communities, including R2 sensitive species and Forest plant species of local concern. The direct impacts of roads and trails (which for this analysis include trailheads) are possible loss of plant individuals, plant occurrences, and plant communities. Plants are not able to move to avoid construction or use of a road or trail.

Indirect impacts to plant species and plant communities include:

(1) increased introduction of invasive species leading to increased competition for resources and increased potential for impact from invasive species control (i.e. spray from herbicide application)

(2) alteration of hydrology patterns and degraded water quality

(3) alteration of habitat conditions (such as decrease in canopy cover or change in successional stage, increased soil compaction, accelerated erosion, altered soil microbial/mycorrhizal activity, and nutrient availability)

(4) increased access for disturbance vectors (including humans and animals) which lead to increased disturbances such as trampling, cropping, and collecting

(5) disruption of pollinators

(6) increased dust (causes increased sediment, also plugs stomata (gas exchange structures) on plant leaves)

(7) an increase in plant numbers (in some cases) adjacent to roads and trails from a nearby occurrence, mainly due to increased water availability from concentrated runoff

(8) habitat fragmentation for some species from roads, which can fragment habitat into smaller patches and increase the ratio of edge to forest interior areas.

Alternative C would have the most miles of motorized routes that could disturb native plant species and plant communities (including R2 sensitive plant species and Forest plant species of local concern), followed by Alternatives B, A, E and D, respectively. The increase in routes in Alternatives B and C would likely offset some of the benefits of closing areas to motorized cross-country travel. Still, the net result is expected to be a benefit due to the amount of area closed to cross-country travel. The miles of routes in Alternative E would remain at the existing level.

Management protective of suitable habitat (such as wetlands, paper birch, and spruce communities) and natural processes within them is an important part of management protective of native plant species and communities. Target plants are not always observed when present, and many times may simply not be present due to the seasonality of the surveys. Some reasons are that plants may not be in prime growth stage for identification, they may be in dormancy, or they may be difficult to see in surrounding vegetation.

The action alternatives would not allow unrestricted motorized cross-country travel. These alternatives are expected to have a net beneficial effect from closing much of the Forest to motorized cross-country travel. Disturbances from cross-country travel are expected to be reduced and there would be a beneficial effect in reducing invasive weed spread and disturbance-created seedbeds.

All the action alternatives are expected to have less chance of direct and indirect effects to native plant species and communities (including sensitive plants) than Alternative A because they have less area open to cross-country travel. Of the action alternatives, Alternative C is expected to have the most effects to native plant species and communities (including R2 sensitive plant species and Forest plant species of local concern) followed by Alternatives B, E and D, respectively, based on the miles of routes open to motorized travel (see Figure 16).

Motorized game retrieval can affect native plant species and communities through disturbance. The effects of motorized game retrieval are expected to be minor. Most motorized game retrieval involves big game in the fall, which is outside the majority of plant species' reproductive seasons. Of the action alternatives, Alternative C would allow motorized game retrieval on the most acres followed by Alternative B, D, and E respectively (see Figure 17). Alternative B would reduce impacts from existing conditions because it only allows game retrieval for elk (which has far fewer hunters than would need to retrieve game than for elk and deer) and in a reduced area. Alternative C would reduce impacts from existing conditions because it has less acreage open to motorized game retrieval, but may have more impacts than Alternative B in the retrieval area because it allows retrieval of elk and deer. Alternatives D and E are expected to have the least impacts from game retrieval because motorized game retrieval is not allowed.

Motorized dispersed camping can also disturb native plant species and communities. The comparative levels of effects of motorized dispersed camping are estimated using the acreage open to motorized dispersed camping. Of the action alternatives, Alternative C has the most acreage open to motorized dispersed camping, followed by Alternatives B, D and E (see Figure 18).

Overall, the action alternatives are expected to have a net benefit to native plant species and communities (including R2 sensitive plant species and Forest plant SOLC) due to the closing of areas to motorized cross-country travel. Alternative D is expected to have the most benefit because it has the fewest motorized routes and the least area open to motorized cross-country travel, followed by Alternatives E, B and C.

Direct and Indirect Effects Common to R2 Sensitive and Forest Plant Species of Local Concern with a Habitat Preference of Wetlands, Riparian Areas, Fens and Seeps

Plant species in wetlands, riparian areas, and seeps are likely to be impacted by changes in hydrology and water quality. Roads and trails in the water influence zone in wetlands can cause increased erosion, which can modify streambank geometry and cause an increase in overland flow. Increases in overland flow will have the net effect of maximizing runoff and minimizing infiltration. While the increased runoff results in overall greater water yield, the storm water is delivered relatively quickly through surface processes rather than through sustained subsurface flows, which are often critical to wetland hydrology (Moore et al. 2006).

Changing normal wetland hydrology (e.g., decreasing site moisture in areas) could negatively impact plants by reducing water available for necessary biological functions. Degradation of water quality in infiltrating surface and groundwater may also affect wetland plant species by altering normal available nutrients. There may also be local changes in the natural soil balance (chemical make-up, nutrients, microbes, etc.) which can impact plants in the area. Roads and trails can lead to soil compaction, especially in areas with moist to saturated soils. Soil compaction can negatively impact plant occurrences by changing the regular water infiltration

through the soil and decreasing oxygen available to plant roots and other essential soil organisms.

More than half the plant species of concern in the Black Hills (R2 sensitive and Forest plant species of local concern) are associated with wetland and riparian areas. Consequently, management protective of general riparian and wetland habitat and processes is an important component of protection for native plant species and communities (including R2 sensitive plant species and Forest plant species of local concern).

Effects to the riparian habitat and associated species are mitigated through a wide variety of standards and guidelines, watershed conservation practices, and state best management practices that protect riparian areas. Forestwide standards and guidelines protect riparian areas, water influence zones, and wetlands. Standard 3106 states that riparian areas or wetlands where populations of R2 sensitive species and plant species of local concern are located are to be avoided during ground-disturbing activities. Long-term riparian ecosystem health and ecological function are provided for by not allowing actions that would be detrimental to riparian-ecosystem condition (Standards 1301, 1302). Objective 105 strives to prohibit motorized vehicles in wetlands, wet meadows, and riparian areas. Standard 1113 minimizes sediment discharge into streams, lakes, and wetlands during road construction and other site disturbances. Guideline 9107 prohibits land vehicles from entering perennial steams where resource damage would occur. Guideline 9108 restricts vehicle traffic to roads and trails in riparian areas.

Alternative A is the only alternative that would allow unrestricted motorized cross-country travel. This could lead to more user-created routes that could further affect riparian vegetation. The effects of motorized game retrieval and dispersed camping on riparian habitat are expected to be similar to those discussed above for the Forest in general. The effects of disturbance to riparian habitat is based on the miles of motorized routes in riparian habitat and the acres of riparian habitat open to motorized cross-country travel (see Figure 22). Disturbance impacts are expected to continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and impact riparian habitat.

In Alternatives B, C and D, Route 385.1A is proposed to be changed from a closed road to an open road. This route intersects South Fork Castle Creek Fen. If this road is opened as proposed, irreversible impacts could occur to the identified fen. This would be in conflict with FS Handbook 2509.25, 12.4 Management Measure (6), Design Criteria 1e, which states “Avoid any loss of rare wetlands such as fens and springs. NOTE: These wetlands cannot be replaced in-kind”.

Two segments of Route 304.1L are proposed to be changed from a road to a trail in the Newton Fork fen and riparian area. The effects to the fen and riparian area are expected to be similar to what is currently occurring on the existing road. There may be an incremental increase in impacts if the use increases in the area.

None of the action alternative would allow motorized cross-country travel, except as noted for Alternatives B and C for motorized game retrieval and dispersed camping. This is expected to have a positive effect on riparian habitat by reducing disturbance impacts.

Alternative C has the most motorized routes in riparian habitat, followed by Alternatives B, A, E and D, respectively. Still, the action alternatives are expected to have a net positive effect on riparian and wetlands habitat due to the amount of habitat closed to motorized cross-country travel.

Direct and Indirect Effects Common to R2 Sensitive and Forest Plant Species of Local Concern with a Habitat Preference of White Spruce Plant Communities

Under Alternative A, motorized cross-country travel would be expected to continue in much of the spruce habitat. Disturbance would continue to occur in areas where motorized cross-country travel occurs. Disturbance impacts are expected to continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and impact native plant species in spruce communities.

None of the action alternatives would allow motorized cross-country travel except as noted for Alternatives B and C for motorized game retrieval and dispersed camping. This is expected to have a positive effect on native plant species in white spruce communities by reducing disturbance impacts.

Alternatives A, B, and E have the most motorized routes in spruce habitat, followed by Alternatives C and D, respectively. Still, the action alternatives are expected to have a net positive effect on native plant species in white spruce communities due to the amount of area closed to motorized cross-country travel.

Direct and Indirect Effects Common to R2 Sensitive and Forest Plant Species of Local Concern with a Habitat Preference of Hardwood Plant Communities

Alternative A would continue to allow motorized cross-country travel in much of the hardwood habitat. Disturbance would continue to occur in areas where motorized cross-country travel is allowed. Disturbance impacts are expected to continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and impact native plant species in stands of paper birch/hazel forest and bur oak/ironwood forest. None of the action alternatives would allow motorized cross-country travel. This is expected to have a positive effect on native plant species in stands of paper birch/hazel forest and bur oak/ironwood forest by reducing disturbance impacts.

Alternative C has the most motorized routes in hardwood plant communities, followed by Alternatives B, A, E and D, respectively (see Figure 21). Still, the action alternatives would have a net positive effect on native plant species in stands of paper birch/hazel forest and bur oak/ironwood forest due to the amount of habitat closed to motorized cross-country travel.

Direct and Indirect Effects to Region 2 Sensitive Species

Effects to Region 2 sensitive plant species are discussed in detail in the accompanying Biological Evaluation. The following is a summary of the analysis of effects for each species.

***Epipactis gigantea* (stream orchid)** will not be included in the effects analysis portion of this document because: there are no routes proposed in Forest along Cascade Creek; undiscovered occurrences are highly unlikely due to habitat requirement to be located along a stream fed with warm spring water; and there will be no effects from motorized routes, motorized cross-country travel, motorized game retrieval and motorized dispersed camping on *E. gigantea* because none of these are allowed on Forest lands along Cascade Creek (J.H. Keith Memorial/Cascade Springs Picnic Ground, where *E. gigantea* occurs, and Cascade Falls Picnic Area). A determination of "no impact" was made for *Epipactis gigantea* in the biological evaluation for this project.

Lycopodium complanatum (trailing clubmoss)*, Salix candida* (sage willow) *Salix serissima* (autumn willow) *and Viola selkirkii* (Selkirk's violet)

All known occurrences of these four R2 sensitive species are avoided by the proposed routes. The direct and indirect effects for these four species are discussed here simultaneously.

Direct mortality from vehicles is possible for all alternatives because undiscovered occurrences could be impacted in all alternatives. The miles of motorized routes on the Forest and in suitable habitat and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered occurrences. The effects of motorized routes, motorized cross-country travel, motorized game retrieval, and motorized dispersed camping on these four species are expected to be similar to the general discussions on riparian/wetland, white spruce and paper birch/hazel forest above.

Site-specific Analysis - In areas with botanical survey, there are no proposed routes that intersect known occurrences or surveyed suitable habitat for these four species in any alternatives.

All Alternatives - Botanical surveys are not 100 percent accurate, so it is possible that any alternative may impact individuals not observed during survey. However, the number would be small and likely to neither result in a loss of viability across the Forest nor cause a trend toward federal listing.

The effects analysis assumes that monitoring of occurrences will occur and that any discovered impacts will be mitigated.

The Forest Plan Phase II Amendment determined these species are likely to persist on the Forest (USDA Forest Service 2005a). This project will not change any of the standards, guidelines or objectives that provide for these four species or the riparian/wetland, white spruce and paper birch/hazel forest. Riparian/wetland communities, white spruce communities, and paper birch/hazel forest would be maintained in all alternatives.

These four species, *Lycopodium complanatum, Salix candida, Salix serissima* and *Viola selkirkii*, have a determination of "**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing**" for all alternatives. This determination is based on the following assumptions:

- Known occurrences will not be impacted by this project.
- There is a possibility that unknown occurrences may occur in unsurveyed areas, routes in these areas will be mitigated as occurrences are found to avoid impacts.

Alternative A would maintain current conditions. Alternatives B, C, D, and E are expected to have a net benefit to *Lycopodium complanatum, Salix candida, Salix serissima* and *Viola selkirkii* by closing areas to cross-country travel.

Botrychium campestre (prairie moonwort)*, Botrychium lineare* (slender moonwort), *Carex alopecoidea* (foxtail sedge), *Cypripedium parviflorum* (lesser yellow lady's slipper), *Platanthera orbiculata* (lesser roundleaved orchid), *Sanguinaria canadensis* (bloodroot), *and Viburnum opulus* var. *americanum* (highbush cranberry)

Known occurrences of these seven R2 sensitive species are intersected by the proposed routes. The direct and indirect effects for these seven species, will be discussed here simultaneously.

Direct mortality from vehicles is possible for all alternatives because undiscovered occurrences could be impacted in all alternatives. The miles of motorized routes on the Forest and in suitable

habitat and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered occurrences. The effects of motorized routes, motorized cross-country travel, motorized game retrieval, and motorized dispersed camping on these seven species are expected to be similar to the general discussions on riparian/wetland, white spruce and paper birch/hazel forest above.

Site-specific Analysis:

Alternative A

Current use of authorized routes will continue.

Alternative B

- Route 841.1L intersects a known occurrence of *Carex alopecoidea*
- Route 864.1 intersects a known occurrence of Botrychium lineare and 2 known occurrences of *Viburnum opulus* var. *americanum*
- Route U71002 intersects a known occurrence of *Carex alopecoidea*
- Routes 863.2C, U080045, and CZ17901 intersect 3 known occurrences of *Cypripedium parviflorum*
- Routes U650017, U0801056 and CZ4846 intersect 4 known occurrences of *Viburnum opulus* var. *americanum*
- Routes CZ0418, U010076, and U010071 intersect 2 known occurrences of *Platanthera orbiculata*
- Routes 567.1F and 172.1A intersect a known occurrence of *Sanguinaria canadensis*

Alternative C

- Routes 841.1L and U710024 intersect 2 known occurrence of *Carex alopecoidea*
- Route 872.3 intersects a known occurrence of *Botrychium campestre*
- Route 864.1 intersects a known occurrence of *Botrychium lineare* and 2 known occurrences of *Viburnum opulus* var. *americanum*
- Routes U650017, U0801056 and CZ4846 intersect 4 known occurrences of *Viburnum opulus* var. *americanum*
- Routes 863.2C, U080045, and CZ17901 intersect 3 known occurrences of *Cypripedium parviflorum*
- Routes CZ0418, U010076, and U010071 intersect 2 known occurrences of *Platanthera orbiculata*
- Routes 567.1F and 172.1A intersect a known occurrence of *Sanguinaria canadensis*

Alternative D

- Routes U080045, and CZ17901 intersect 3 known occurrences of *Cypripedium parviflorum*
- Routes 567.1F and 172.1A intersect a known occurrence of *Sanguinaria canadensis*

All Alternatives - Botanical surveys are not 100 percent accurate, so any alternative may impact individuals not observed during survey. However, the number would be small and likely to neither result in a loss of viability across the Forest nor cause a trend toward federal listing if known occurrences are not impacted. The effects analysis assumes that monitoring of occurrences will occur and that any discovered impacts will be mitigated.

The Forest Plan Phase II Amendment determined these species are likely to persist on the Forest, if known occurrences persist (USDA Forest Service 2005a). The prescribed design criteria must be applied to the routes identified and the known occurrences avoided for this project to be consistent with the Forest Plan.

Based on the above analysis (detailed in the accompanying Biological Evaluation) a determination of "**may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing**" is made for these seven species for all alternatives. This determination is based on the following assumptions:

Table 39. Species potentially impacted and routes that will be designed, rerouted or removed to avoid the known occurrences in the identified alternatives

Species	Occurrence	Route Number	Alt B	Alt C	Alt D
Botrychium campestre	BOCA5-8	872.3		X	
Botrychium lineare	BOLI7-1	864.1	X	X	
Carex alopecoidea	CAAL8-12	U71002	X		
	CAAL8-31	841.1L	X	X	
	CAAL8-22	U710024		X	
Cypripedium parviflorum	CYPA19-2	CZ1790	X	X	X
	CYPA19-10	863.2C	X	X	
	950070B	U080045	X	X	X
Platanthera orbiculata	01G040	CZ0418	X	X	
	01G040	U010076	X	X	
	PLOR4-18	U010071	X	X	
Sanguinaria canadensis	SACA13-2	567.1F	X	X	X
	SACA13-2	172.1A	X	X	X
Viburnum opulus var. americanum	VIOPA2-4	U080156	X	X	
	980010	CZ4846	X	X	
	VIOPA2-2	864.1	X	X	
	VIOPA2-16	864.1	X	X	
	03DUG3A	U650017	X	X	
	94S460B	U650017	X	X	

There is a possibility that unknown occurrences may occur in unsurveyed areas, routes in these areas will be mitigated as occurrences are found to avoid impacts. The effects analysis assumes that monitoring of occurrences will occur and that any discovered impacts will be mitigated.

Alternative A would maintain current conditions. Alternatives B, C, D and E are expected to have a net benefit to *Botrychium campestre, Botrychium lineare, Carex alopecoidea Cypripedium parviflorum, Platanthera orbiculata, Sanguinaria canadensis, Viburnum opulus* var. *americanum*, by closing areas to cross-country travel, if, as stated above, the routes are designed to avoid impacts to known occurrences.

Direct and Indirect Effects to Black Hills Plant Species of Local Concern

Effects to Forest plant species of local concern are discussed in detail in the Botanical Resources Report. The following is a summary of the analysis of effects for each species.

***Adiantum capillus-veneris* (southern maidenhair fern) and *Eleocharis rostellata* (beaked spikerush)** will not be included in the effects analysis portion of this document because: there are no routes proposed along Cascade Creek; undiscovered occurrences are highly unlikely due to habitat requirement to be located along a stream fed with warm spring water; and there will be no effects from motorized routes, motorized cross-country travel, motorized game retrieval and motorized dispersed camping on *A. capillus-veneris* and *E. rostellata* because none of these are allowed on Forest lands along Cascade Creek (where *A. capillus-veneris* and *E. rostellata* occur).

Botrychium multifidum (leathery grapefern), *Carex bella* (southwestern showy sedge), *Listera convallarioides* (broadlipped twayblade orchid), *Lycopodium annotinum* (stiff clubmoss), *Oxyria digyna* (alpine mountainsorrel), *Petasites sagittatus* (arrowleaf sweet coltsfoot), *Polystichum lonchitis* (northern hollyfern), *Salix lucida ssp. caudata* (shining willow)

All known occurrences of these eight Black Hills plant species of local concern are avoided by the proposed routes. The direct and indirect effects for these eight species will be discussed here simultaneously.

Direct mortality from vehicles is possible for all alternatives because undiscovered occurrences could be impacted in all alternatives. The miles of motorized routes on the Forest and in suitable habitat (riparian, white spruce, or paper birch/hazel communities) and the amount of habitat open to cross-country travel is used here to estimate effects to undiscovered occurrences. The effects of motorized routes, motorized cross-country travel, motorized game retrieval, and motorized dispersed camping on these eight species are expected to be similar to the general discussions on riparian, white spruce, and paper birch/hazel forest above.

Site-specific Analysis - In areas with botanical survey, there are no proposed routes that intersect known occurrences or surveyed suitable habitat for these eight species in any alternatives.

All Alternatives - Botanical surveys are not 100 percent accurate, so it is possible that any alternative may impact individuals not observed during survey. However, the number would be small and not likely to impact persistence on the Forest, if known occurrences on the Forest are not impacted.

The Forest Plan Phase II Amendment determined these species are likely to persist on the Forest (USDA Forest Service 2005a). This project is consistent with the Forest Plan for these species and/or their riparian/wetland, white spruce, and paper birch/hazel forest habitat. Riparian/wetland areas, white spruce communities, and paper birch/hazel forest would be maintained in all alternatives.

Gentiana affinis (pleated gentian)

Three proposed routes intersect with three known occurrences of *Gentiana affinis* in Alternatives B and C.

Direct mortality from vehicles is possible for all alternatives because undiscovered occurrences could be impacted in all alternatives. The miles of motorized routes on the Forest and in suitable habitat (riparian/wet meadow communities) and the amount of habitat open to cross-country

travel is used here to estimate effects to undiscovered occurrences. The effects of motorized routes, motorized cross-country travel, motorized game retrieval, and motorized dispersed camping on *Gentiana affinis* are expected to be similar to the general discussion on riparian/wetland areas above.

Site-specific Analysis - In areas with botanical survey, there are 3 proposed routes that intersect 3 known occurrences of *Gentiana affinis* in Alternatives B and C, and one additional route that intersects a known occurrence of G. affinis in Alternative C.

Design Criteria - Three proposed routes intersect three known occurrences of *Gentiana affinis* in Alternatives B and C and one additional route intersects a known occurrence in Alternative C. In order to be consistent with the Forest Plan and therefore ensure the persistence of this species on the Forest, the following must be done in Alternatives B and C:

- Design route HC9 (new route) to avoid impacts to occurrences GEAF-4
- Design route CZ3526 (new route) to avoid impacts to occurrence GEAF 07B040A
- Design route HC1 (new route) to avoid impacts to occurrence GEAF 07B042

In addition, Alternative C has one additional proposed route that must be designed to avoid impacts:

- Design route CZ4927 (new route) to avoid impacts to GEAF 07M008A and riparian impacts

All Alternatives - Botanical surveys are not 100 percent accurate, so any alternative may impact individuals not observed during survey. However, the number would be small and not likely to impact persistence of the species on the Forest. The Forest Plan Phase II Amendment determined this species is likely to persist on the Forest (USDA Forest Service 2005a), if known occurrences are not impacted. This project will be consistent with Forest Plan standards that provide for *Gentiana affinis* and its habitat if the design criterion described above is applied.

Direct and Indirect Effects to Management Area 3.1 Botanical Areas

The Forest designated eight areas as Management Area 3.1 Botanical Areas in the 1997 Forest Plan. Various disturbances of these areas can cause changes to their environment and damage that may take a long time to restore or may never be restored.

Roads can provide easy access to M.A. 3.1 Botanical Areas by OHVs, even through there are currently road closures in effect for all M.A. 3.1 Botanical Areas. If a road passes through or near a botanical area it may contribute to the introduction of invasive species (including noxious weeds), alteration of hydrology patterns, alteration of habitat condition (such as decrease in canopy cover or change in successional stage), increased access for disturbance vectors (including humans and livestock). The introduction of invasive species, alteration of hydrology patterns, alteration of habitat condition, and increased access for disturbance vectors may lead to increased disturbances. Increased disturbances may include vegetation trampling, cropping, and collecting, disruption of pollinators, increased dust, and sedimentation.

Site-specific Analysis - There are two botanical areas affected by proposed routes in Alternatives B and C. Routes 864.1, 864.1A and 864.1C are currently closed routes that are proposed to be opened. Forest Plan Guideline 3.1-5103 states the Dugout Gulch Botanical Area has a Recreation Opportunity Spectrum of Semi-primitive Nonmotorized. Opening this route to motorized vehicles would be in conflict with that guideline.

Route 228.1A is proposed to be changed from a road to a trail in the Englewood Springs Botanical Area. The effects to the botanical area are expected to be similar to what is currently occurring on the existing road. There may be an incremental increase in impacts if the use increases in the area as other areas become closed to ATVs.

Cumulative Effects

The cumulative effects analysis is bounded in time as the next 5 to 15 years. This temporal scale is based on: (1) the time over which one can expect to predict reasonably foreseeable actions and (2) roughly the time until the next Forest Plan Revision. The spatial scale for cumulative effects analysis generally encompasses the area within the Forest boundary. This area was chosen because it encompasses ecosystem components and species that occur on the Forest. A larger area would include the surrounding plains, which includes a vastly different suite of species and ecosystem components.

Activities such as vegetation management, fuels management, livestock grazing, recreational activities and other management activities have occurred and will continue to occur on the Forest. These activities will likely occur on private lands as well. All may affect plant species of concern (R2 sensitive plant species and Forest plant species of local concern) and botanical resources through direct mortality, habitat alteration, or spread of invasive species. On the Forest, these potential effects are lessened or negated for known occurrences by avoiding the locations during project design.

Management of national and state parks adjacent to the Forest would have an unknown effect on plant species/communities and other botanical resources. Wind Cave National Park and Jewel Cave National Monument likely contain little spruce habitat because they are located in the southern Black Hills where spruce is sparse or absent. Spruce occurs in Custer State Park, mostly at the north end near recreation sites. These parks emphasize recreational opportunities and will likely manage hardwoods as desired species where possible. National parks and monuments tend to manage to preserve natural conditions, using fire and other processes, which would likely provide conditions under which hardwoods and other habitats evolved. Management in national and state parks will likely contribute to the conservation of plant species/communities and botanical resources.

Privately owned lands within the Black Hills Ecoregion may also provide suitable habitat, but resource management by companies and private citizens depends on a number of factors (e.g., desired goals, market prices, development potential) making it difficult to predict future trends in private habitat diversity and quality. Potential habitat for species, communities, and locations may occur on private lands across the Black Hills. Continued urban development in the Black Hills will likely continue to affect species, communities, and locations, thereby increasing the importance of these botanical resources on National Forest System lands.

There could be some incremental impacts to individual plant species, communities, and botanical resources. In Alternative A, incremental impacts would continue to accrue as motorized recreation use levels increase. User-created routes are expected to continue to be created and could incrementally impact plant species, communities, and botanical resources.

Alternatives B, C, D, and E would reduce the amount of area open to cross-country travel, thereby reducing some of the effects of past activities and offsetting some impacts from non-FS lands. Incremental impacts from these alternatives are expected to be positive. Alternative D would reduce impacts the most by having the least amount of area including plant species and

communities and botanical resources open to cross-country travel and the least miles of motorized routes.

Scenery

Introduction

Scenery is defined as the general appearance of a place and the features of its views or landscapes: the arrangement of predominantly natural features of the landscapes we see. The adjective "scenic" has to do with natural scenery, which affords beautiful views.

"Research has shown that high-quality scenery, especially that related to natural-appearing forests, enhances people's lives and benefits society...Research findings support the logic that scenic quality and naturalness of the landscape directly enhance human well-being, both physically and psychologically, and contribute to other important human benefits. Specifically these benefits include people's improved physiological well being as an important by-product of viewing interesting and pleasant natural appearing landscapes with high scenic diversity." (USDA Forest Service 1995, pg. 17)

In 2003, a National Visitor Use Monitoring project was conducted on the Black Hills National Forest. Recreation use on the National Forest for the fiscal year was calculated at 1,252,175 visits. As part of that project, visitors were interviewed to determine their satisfaction with the Forest. They also identified areas they had visited (Table 14) - in order of highest use: (1) picnic areas, (2) scenic byways, (3) forest roads, (4) forest trails, and (5) developed campgrounds. The top four activities visitors participated in were (Table 13): (1) Viewing Wildlife - 62 % (of respondents), (2) Relaxing - 57 %, and (3) Viewing Natural Features - 51 %, Driving for Pleasure – 39%.

With regard to the satisfaction of the visitors experience in Wilderness, Developed Day Use Areas, Developed Overnight (Campground) Areas, and General Forest Areas (Tables 11, 17, 18, 19); the highest importance and satisfaction rating was given for the Scenery and Condition of Environment in each category (Kocis 2004, pg. 6, 11, 13, 14, 18-20).

The natural beauty that makes up the scenery of the Forest is one of the most important elements or resources that draws our recreation visitors. Forest management practices directly affect people's perceptions of scenic beauty.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Federal Laws. Federal laws that require all Federal management to consider scenery and aesthetic resources in land management planning (relevant to this Planning Area; USDA Forest Service 1995, pg. B-1) include:

- National Trails System Act of 1968
- National Environmental Policy Act of 1969
- Environmental Quality Act of 1970
- Forest & Rangeland Renewable Resources Planning Act of 1974
- National Forest Management Act of 1976
- Public Rangelands Improvements Act of 1978

Forest Service Manual Direction. On March 10, 1997, the Washington Office of the Forest Service provided implementation direction to use the Scenery Management System during forest plan revisions and project level planning. In addition, there was a "white paper" attached that provided guidance in this implementation. On May 2, 2003, the FS manual direction was amended to provide further clarification to utilize the Scenery Management System in forest and project planning and implementation, which included the following section:

2382.4 Applications to Project Management - 8. Determine how scenery management techniques and principles can be used to mitigate any land altering activity or introduced elements on the land, to achieve and maintain desired scenic integrity objectives and landscape character goals.

Forest Plan Direction. The 1997 Revised Land and Resource Management Plan for the Forest, As Amended by the Phase II Amendment (LRMP) included the Scenery Management System as the basis for analyzing the scenic resource (USDA Forest Service 2006a, pp. II-59 - 61). This management plan provides goals, objectives, and guidelines for scenery management as follows:

Forestwide Goal 4 - Provide for scenic quality, a range of recreational opportunities, and protection of cultural resources in response to the needs of the Forest visitors and local communities.

The objectives and guidelines are listed below. Details of each objective and guideline are in the Scenery specialist report in the project record.

Objectives: 401, 402, and 420

Guidelines: 5601, 5602, 5603, 5604, 5608, and 5609

Methodology

Scenery is evaluated by an indicator, scenic integrity, which identifies and measures the distinct aspects of scenic quality. Scenic integrity measures the amount of natural or socially valued appearance in a landscape along with the amount of visual disturbance that contrasts with and detracts from that appearance (the valued scenic character) existing at the time of measurement. It provides information regarding the presence, intensity and dominance of human-caused visual disturbances in the landscape, such as timber harvesting, road construction, mining, utility corridors, recreation facilities, ski areas or other special uses.

Scenic integrity also applies to extreme scenery disturbances caused by natural events whenever these events are outside the historic range of variability (HRV) for the landscape. Large-scale or high intensity events such as catastrophic wildfires, insect/disease outbreaks, or wind/ice storms that exceed the HRV are considered negative visual disturbances to the valued scenic character, while those within HRV are considered positive elements.

Scenic Integrity measures these disturbance effects in degrees of consistency, harmony, dominance, and contrast with the valued scenic character being viewed at the time of measurement. It indicates the presence and magnitude of visual disturbance (contrast in form, line, color, texture, pattern, size or scale) to that valued scenic character. It uses a graduated scale of six levels from 'very high integrity' to 'no integrity.' The highest scenic integrity ratings apply to scenery that appears natural and unaltered, with little or no contrast to or disturbance of the valued scenery attributes. Scenic Integrity levels define the minimum degree of natural or socially valued appearance and disturbance that either exists now (existing scenic integrity), or is

a standard or guideline defining minimally acceptable levels (scenic integrity objectives) that would be permitted on future management projects. Scenic integrity levels (USDA Forest Service 2006a, Glossary – p. 61) are defined as:

- **Very High Integrity** - the valued scenery "appears natural or unaltered." Only minute visual disturbances to the valued scenery, if any, are present. When used as a standard or guideline, this level should be achieved immediately upon project completion.
- **High Integrity** - the valued scenery "appears natural or unaltered," yet visual disturbances are present; however, they remain unnoticed because they repeat the form, line, color, texture, pattern and scale of the valued scenery. When used as a guideline, this level should be achieved as soon after project completion as possible or within 3 years maximum.
- **Moderate Integrity** – the valued scenery "appears slightly altered." Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern and scale. When used as a standard or guideline, this level should be achieved as soon after project completion as possible or within 3 years maximum.
- **Low Integrity** - the valued scenery "appears moderately altered." Visual disturbances are co-dominant with the valued scenery, and may create a focal point of moderate contrast. Disturbances may reflect, introduce or "borrow" valued scenery attributes from outside the landscape being viewed (such as the size, shape, edge effect and pattern of natural openings; vegetative type changes or socially valued architectural styles). Scenery attributes borrowed from outside the viewed landscape appear compatible with or complimentary to those within. When used as a standard or guideline, this level should be achieved as soon after project completion as possible or within 3 years maximum.
- **Very Low Integrity** - the valued scenery "appears heavily altered." Disturbances dominate the valued scenery being viewed; and they may only slightly borrow from, or reflect, valued scenery attributes within or beyond the viewed landscape (due to their size, shape, edge effect and pattern). However, disturbances must be shaped and blended with the natural terrain (primary landforms) so they do not dominate the overall composition when viewed as background (beyond 3 to 4 miles). Such disturbances might include unnatural appearing openings, roads, landform modifications or structures. If used as a standard or guideline, this level applies immediately upon project completion. However, its use as a management objective or standard/guideline is strongly discouraged; its primary use should be to inventory existing scenic integrity.

Scenic integrity objectives are given in the Forest Plan for each management area (USDA Forest Service 2006a, Chapter 2, pp. 59 – 60)

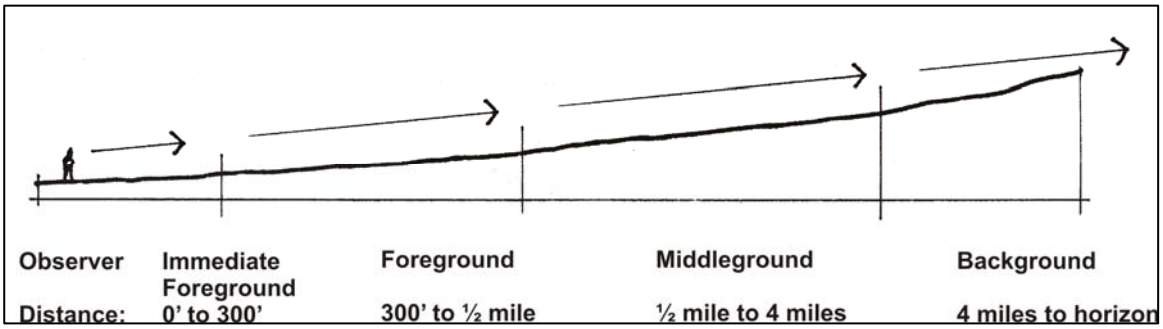

Figure 34. Landscape distance zones (USDA Forest Service 1995, Chapter 4, p. 5)

Landscape visibility is the portion of landscapes visible from travelways and use areas and that are important to constituents for their scenic quality, aesthetic values, and landscape merits. Travelways and use areas are identified and classified during the Forestwide planning process in order to determine which observer locations, and their importance, to use in the landscape visibility analysis. Sensitivity Level 1 travelways that lead to important scenic features, residential areas, resorts, recreation areas, unique natural phenomena, wilderness trailheads, national parks, and State and county parks, attract a higher percentage of users having high concern for scenic quality, thus increasing the importance of those travelways (USDA Forest Service 1995, Chapter 4, p. 7).

Sensitivity Level 1 travelways that constituents have a high level of concern for scenery around the Forest include: WY State Hwy. 24, I-90, Spearfish Canyon Scenic Byway (US Hwy. 14A), US Hwy. 85, Mickelson Trail #104, U.S. Hwy. 385, Centennial Trail #89, County Road 234 (Nemo Road), SD Hwy. 44, County Road 228 (Sheridan Lake Road), Peter Norbeck National Scenic Byway (SD State Hwy. 244, US Hwy. 16/385, US Hwy. 16A, SD State Hwy. 87, SD State Hwy. 89) US Hwy. 16, US Hwy. 16A, SD State Hwy. 40, SD State Hwy. 87, SD State Hwy. 89, Deerfield Trail #40, Deerfield Loop Trail #40L, US Hwy. 18, and other summer and winter recreation trails nonmotorized trails.

Sensitivity Level 2 travelways that constituents have a moderate level of concern for scenery in the Forest include county roads and main Forest collector roads, and winter snowmobile trails. Travelways with a low level of constituent concern for scenery in the Forest are Forest development roads.

Use areas are spots that receive concentrated public-viewing use. They include national forest visitor centers, vista points, trailheads, campgrounds, picnic grounds, swim beaches, marinas, resorts, ski areas, and other recreation sites. Use areas also include(s) urban and suburban areas, towns and villages, subdivisions, parks and golf courses on private land, or other public lands within or adjacent to national forests (USDA Forest Service 1995, Chapter 4, p. 7). Use areas with a high level of constituent concern for scenery in and around the Forest include: Deerfield Lake Recreation Area, Pactola Lake Recreation Area, Sheridan Lake Recreation Area, area communities (Custer, Deadwood, Hill City, Hot Springs, Johnson Siding, Keystone, Lead, Rapid City, Rochford, Sundance, Spearfish), Mount Rushmore National Memorial, Jewell Cave National Monument, Wind Cave National Park, Custer State Park, lakes, campgrounds, and trailheads.

Portions of landscapes seldom seen from travelways and use areas are also important to constituents for their aesthetic and scenic values. They may be of even greater importance as special recreation settings and as opportunities for people seeking solitude (USDA Forest Service 1995, Chapter 4, p. 7). Seldom seen use areas with a very high level of constituent concern for scenery in and around the Forest include Management Area 1.1A Black Elk Wilderness. Seldom seen use areas with a high level of constituent concern for scenery where ‘users expect to experience some isolation from the sights and sounds of people’ in natural appearing landscapes: 3.1 Botanical Areas, 3.2A Inyan Kara Mountain, 3.31 Backcountry Motorized Recreation Emphasis, 3.32 Backcountry Nonmotorized Recreation Emphasis, and 3.7 Late-successional Forest Landscapes Norbeck Wildlife Area (USDA Forest Service 2006a, Chapter 3, p. 3).

Assumptions.

- Existing roads and trails are most visible in the immediate foreground distance zone when viewed from travelways, due to vegetation and terrain.

- When located on steep slopes at higher elevation, or when the viewer is at a vista (such as Harney Peak) looking down on the landscape, roads and trails can be visible in all the distance zones.
- The duration of view, such as a person standing at a vista point, slowly traveling down a path (walking or riding), or traveling at high speed in a vehicle, determine how visible objects, forms, lines, colors, etc., are in the landscape.
- Changes in route density may have a negative, or positive, effect on the Foreground and Middleground views of U.S., State & County highways. The public may lose, or gain, motorized access to points with panoramic vistas, or areas of unique features.

The analysis of the effects on scenery was based upon:

- Review literature for new research of effect of roads & trails on scenery.
- Forest GIS layers for the Scenic Resource and topographic maps.
- Validation of assumptions and GIS analysis, thru field reviews of existing roads, existing citizen trails, and identified locations of new trail construction.
- Training and experience analyzing the effect of management activities on scenery.

Indicators. Effects on scenery, specifically changes from the existing condition - by scenic integrity objective (SIO) - are the key concerns.

Indicators:

- Miles of new trails by SIO.
- Miles of roads converted to trail by SIO.
- Miles of open roads closed by SIO.
- Miles of closed roads open by SIO.
- Acres open to game retrieval by SIO.
- Acres open to dispersed camping by SIO.

Affected Environment

The Black Hills National Forest provides a strikingly different environment and a cool oasis during the summer months, for those living in the surrounding great plains. As a result, the Forest is a recreation destination that also provides the backdrop for the surrounding private land, and national and state parks. Concern for scenery is high. In the 2004 National Use Visitor Monitoring, three of the top five visitor-use activities directly related to scenery (driving for pleasure, view natural features, viewing wildlife). With regard to the satisfaction of the visitor's experience when visiting the Forest, the highest importance and satisfaction rating was given for the scenery and condition of environment in each category (Kocis 2004, pp. 6, 11, 13, 14, 18-20)

To verify the existing scenic integrity condition, site visits were made to four areas that are representative of existing OHV routes, to compare Forest Plan scenic integrity objectives (SIOs) with actual effects from OHV use. Representative sites that were visited included:

- **U.S. Hwy. 14A & Camp 5 (SD):** Steep terrain, drainage, trails located in both areas – viewed in the immediate foreground perspective of a hiker and foreground and middleground from a vehicle. Findings were OHV routes on steep slopes were not evident due to a combination of viewer location (approx. 30 to 90 degrees off

centerline), vegetation (trees, shrubs & grasses), and narrow width of trail (approx. 60 inches). The existing scenic integrity in this area was high.

- **Thompson Gulch & FDR 863 & 864 (WY):** Steep terrain, drainages, trail located up bottom of steep drainage – viewed in the immediate foreground perspective of a hiker. OHV trail up drainage has had limited use and is very narrow – it appears no different that a game or stock trail. Trails on top of the buttes (near FDR 864) have had more use, but are not apparent unless you are within 50 feet due to the relatively flat rocky terrain and grass vegetation. The existing scenic integrity in this area was moderate to high.
- **Community of Nemo (Nemo Road) and U.S. Hwy. 385 from Strawberry Campground to Sheridan Lake South Entrance (SD)**: A variety of terrain, vegetation, and trails crossings, or paralleling, the highway – viewed in the immediate foreground, foreground and middleground from a vehicle. Findings included: trails were not evident when viewed in the middleground; trails that crossed the highway in the immediate foreground, at a 60- to 90-degree angle to the Highway, and were evident for such a short period (when the vehicle was traveling at 45 to 55 mph) that they did not readily standout in the landscape. The existing scenic integrity in this area was moderate to high. When trails parallel the Hwy. 385 (such as from junction of Nemo Road to Custer Peak Quarry), the OHV trail is readily evident – the obvious human-caused wheel tracks have eliminated vegetation causing color contrasts and creating lines in the landscape where natural features are expected (in the immediate foreground). As the trail parallels the highway, the view is not fleeting for a short period, but rather the negative visual effects are repeated again and again. The existing scenic integrity in this area was low to moderate.
- **Sheridan Lake (SL) Road (SD).** A variety of terrain and vegetation, trails take off at generally a 90-degree angle from the SL road – viewed in the immediate foreground from a vehicle. Due to the slower speed limit (35 to 45 mph), the observer is able to view trail locations for a greater duration, so they tend to be more evident – primarily due to the soil / vegetation color contrast. The existing scenic integrity in this area was moderate to high.

Generally, existing OHV use is on existing roads that serve other purposes, such as logging, recreation, and permitee access. This access is on developed roads that were constructed for full size vehicles. Constructed road widths are 12 to 16 feet. These roads can be highly visible in the landscape as a ‘line’ that traverses a hillside; in other cases, where there is a large amount of cut and fill, there can be a strong color contrast between the exposed soil and the surrounding vegetation and can stand out a ‘form’ in the landscape – an example of this can be seen across from a Mickelson Trail Trailhead, between Custer and Pringle along U.S. Hwy. 385. As these roads are used for multiple purposes, whether by OHVs or highway vehicles, there is little to no effect on the existing condition by the current use of OHVs on these routes.

Where OHV riders are creating their own trails, these routes are not designed with resource protection in mind. The width of these routes tends to be that of the vehicle riding on them. When these roads are located on steep slopes and go straight up the hill, color contrasts from soil, vegetation and vertical lines straight up the slope create negative visual effects from these trails. These effects are predominantly evident in the immediate foreground, but can also be visible in other distance zones.

Environmental Effects Analysis

Direct and Indirect Effects

Alternative A

Direct Effects - The existing visual condition with regard to motorized use on existing roads would not change and there would be no effect. Cross-country motorized use would continue in an unregulated manor. Visual impacts are generally not evident in the foreground, middleground, and background distance zones. Negative visual impacts are evident in the form of vegetation loss, color contrasts, and unnatural appearing lines in the immediate foreground. These impacts are most evident from 'braided' (parallel) trails, hill climbs (steep topography), and 'mud bogging' (rutting moist areas / meadows creating color contrasts) and damaging plant communities that are specifically enjoyed for their scenic beauty. The type of visual impacts would likely incrementally increase as the amount of motorized use also increases. The existing level of scenic integrity would be reduced over time. Over time more effects will be evident in the foreground of U.S., State, and County highways, particularly where use is funneled by topography vegetation, or surrounding private land.

Areas being managed for nonmotorized recreation (where people specifically go to view scenery on a macro-scale) whether unique vegetation or interesting landforms, will be affected. The smaller the nonmotorized use area, the larger the effect of cross-country unregulated motorized use will have on it.

Effects of Game retrieval and dispersed camping on scenery is expect to stay at the same level (as an increase in big game hunting tags, which this activity is generally linked to, is not expected to increase).

Indirect Effects – Negative effects on scenery of unregulated cross-country travel may be more visible from private land both inside and outside the national forest boundary. Invasive (non-native) plants could be introduced and spread along new trails and areas that have had limited motorized use in the past – thus degrading the natural beauty of an area. The increasing variety, quantity, and spread of invasive species are becoming more evident in the forest. Visually they often stand out in the immediate foreground due to their size, shape, and color. Many observers recognize their impact on the environment and the competition they have with native plants and view them as a negative visual (and ecological) element in the landscape.

Effects Common to all Action Alternatives

Direct Effects – The elimination of unrestricted motorized cross-country travel should halt further visual impacts from this activity. Areas that currently display the effects of this activity should become less evident over time.

Concentrated use areas, 3 to 5 acres in size, would be located in existing rock pits or quarries. No additional impacts from this new use should change the existing condition. New trailheads would be designed and constructed to meet the assigned SIO as directed in the Forest plan for recreation facilities.

Effects Common to all Action Alternatives B, C, D

Direct Effects - The route construction process creates a cleared path across the landscape by excavating and filling material to create a level running surface vehicles can operate on, known as the 'template'. This surface, devoid of vegetation, generally is quite visible as a 'line' across

the landscape. The wider the route surface, and the steeper the side slope of the landform it is on, the more visible the road is and the less natural appearing. Conversely, the narrower the route and the flatter the side slope, the less visible the route will be. However, when an observer is above looking down on a route, it can still be highly evident due to the color contrast with the surrounding vegetation.

Trails less than 50 inches in width generally would have less visual impact due to their narrow width. However, with the concentration of use o these trails, use will increase, and there would likely be no vegetation in the center of the trail that would help the trail blend in. In addition, as vehicles meet and pass one another, the vegetation along the sides of the trails would be impacted and may result in the trails being more visually evident in the landscape.

Single-track trails may be the least evident in the landscape; however, they can be highly evident and create visual impacts if routes traverse steep slopes or have sharp turns 90 degrees or greater. Any trail that is in an open area and has numerous paths side by side (i.e., a 'braided' pattern) can be highly evident and have a negative visual impact. Negative visual impacts take the form of color contrast and vertical (unnatural appearing) lines in the foreground distance zone.

Designating these 'special designation' (rock crawler) trails could increase use and spectators resulting in additional visual impacts in the immediate foreground (due to vegetation loss). These trails are generally in isolated locations with difficult access. Although in places they are on steep terrain, surrounding vegetation generally reduces their visibility in the landscape.

Roads that are closed to motorized use, are generally not obliterated by eliminating the road template and returning the hillside to the natural contours. As a result, roads are generally still evident as an unnatural form and line in the landscape. Other routes that are open only for administrative use (maintenance level 1) will have approximately five vehicle passes per year; the effect of this use should be minimal to not evident at all. When closed roads are open for logging activity, any vegetation that has grown up on them will be removed, and these roads will be more evident during that period of use.

Proposed Motorized Routes That Could Have Negative Visual Impacts in Designated Nonmotorized Areas (Management Areas 4.1)

- Route # 875.2A - Opening closed road, HIGH to MODERATE scenic integrity objective
- Route # 875.2B - Opening closed road, HIGH to MODERATE scenic integrity objective
- Route # 875.2D - Opening closed road, MODERATE to LOW scenic integrity objective
- Route # 875.2E - Opening closed road, MODERATE scenic integrity objective
- Route # 875.2F - Opening closed road, MODERATE scenic integrity objective
- Route # 875.2G - Opening closed road, MODERATE scenic integrity objective

Proposed Motorized Routes That Could Have Negative Visual Impacts

- Route # U260027 – New single-track route that takes off from private land, up a steep slope, in the immediate foreground of Sheridan Lake Road, HIGH scenic integrity objective

Indirect Effects – Any new routes near private land have the potential to be highly visible from any given individual parcel of private land. As a result, individual landowners adjacent to National Forest lands may be individually adversely impacted.

Alternative B

Direct Effects - The quantity of visual impacts from motorized use will be reduced, due to the closing of unauthorized routes and the elimination of unrestricted cross-country motorized use; however the concentration and increased level of use on these designated routes may result in greater visual impacts along them.

Many hunters retrieve game by using motorized vehicles such as pickup trucks and 4-wheelers. This endeavor usually involves traveling slowly to minimize vehicle damage and potential for personal injury. A highway vehicle normally makes only one round-trip to retrieve a harvested game animal. When vehicle speed is limited to less than 5 miles per hour, visual impacts are usually limited to bent grass and crushed decaying small logs and branches. Hunters retrieving game with off-highway vehicles (ATV, UTV, etc.) may have to make multiple trips, depending on the size of the animal and the ATV manufacturer's loading recommendations. Due to repeated driving over the same ground, the potential for more visual impact in the form of displaced soil and covering vegetation is greater than a highway vehicle, but should no longer be evident the following year. Visual impacts from game retrieval would be concentrated to the areas it is allowed – approximately one-fourth the existing level – assuming the same levels of animal hunting tags issued by State fish and game departments in each area.

Repeated vehicle trips over the same ground to access a dispersed campsite can wear away covering vegetation while compacting soil and retard vegetation regrowth. Visual effects from dispersed camping are primarily rutted and/or exposed wheel tracks and areas devoid of vegetation; both creating color contrast in the immediate foreground that draws the eye. These effects may heal in a year; however, repeated use would compact soil, retard revegetation, and take more than a year to heal itself. With the ban on open fires outside of developed camping areas, dispersed camping use in South Dakota would be expected to increase only modestly. The level of visual impacts from dispersed camping should stay the same or increase, due to the proximity and concentration of camps next to the roads.

Trailheads are generally considered a positive cultural element. Although they create an open area, they are normally located on relatively flat ground and the surrounding vegetation limits their visibility in the landscape. In addition, they provide an access point to the surrounding natural landscapes and recreation activities. New trailheads will require careful location and site design to limit their visibility and maximize their utility.

Indirect Effects – No indirect effects were identified.

Table 40. Indicators for Alternative B

Indicators	Scenic Integrity Objective			
	High	Moderate	Low	Very Low
New Routes (miles)	43	159	190	2
Roads to Trails (miles)	21	79	105	0
Open Roads Currently Closed (miles)	0	3	0	0
Close Roads Currently Open (miles)	20	81	122	0
Game Retrieval (acres)				
- Yearlong	21,230	73,595	82,698	1,507
- Seasonal	0	0	0	0
Dispersed Camping (acres)	7,286	25,351	30,307	555

Alternative C

Direct Effects - Alternative C would provide the greatest potential for visual impacts from motorized use, in all distance zones, and all alternatives, as it has the greatest number of miles of authorized motorized routes.

This alternative should have fewer impacts from game retrieval and dispersed camping than Alternative B, as it disperses the use over a wider area. Visual impacts from game retrieval would likely be less than half the existing level. With dispersed camping distance from the road increased to 300 feet, the overall visual impacts should be less evident than Alternative B, due to the greater distance. However, the visual impacts from access and egress to the camps may be similar to Alternative B.

Indirect Effects – No indirect effects were identified.

Table 41. Indicators for Alternative C

Indicators	Scenic Integrity Objective			
	High	Moderate	Low	Very Low
New Routes (miles)	60	226	240	1
Roads to Trails (miles)	20	64	119	0
Open Roads Currently Closed (miles)	0	0	1	0
Close Roads Currently Open (miles)	23	137	171	0
Game Retrieval (acres)				
- Yearlong	28,040	161,489	143,627	3,324
- Seasonal	2,220	17,308	16,632	0
Dispersed Camping (acres)	21,029	76,552	84,756	1,507

Alternative D

Direct Effects - Alternative D would provide the greatest overall reduction in miles of open routes. This alternative has the greatest potential to reduce the existing visual impacts from motorized use in the landscape; however, like Alternatives B, C, and E, this alternative would concentrate use, and corresponding impacts, along roads and trails. No motorized game retrieval and dispersed camping would occur, so visual impacts should be limited to the immediate foreground of roads across the Forest. With the fewest miles of motorized use, this alternative has the least potential to create negative visual effects from motorized use across the Forest.

Indirect Effects – No indirect effects were identified.

Table 42. Indicators for Alternative D

Indicators	Scenic Integrity Objective			
	High	Moderate	Low	Very Low
New Routes (miles)	13	72	79	1
Roads to Trails (miles)	12	50	82	0
Open Roads Currently Closed (miles)	0	0	1	0
Close Roads Currently Open (miles)	4	35	47	0
Game Retrieval (acres)				
- Yearlong	closed	closed	closed	closed
- Seasonal	closed	closed	closed	closed
Dispersed Camping (acres)	closed	closed	closed	closed

Alternative E

Direct Effects - Effects on the visual resource would be similar to Alternative A, with the exception that no cross-country travel (and the resulting impacts) would occur.

Indirect Effects – No indirect effects were identified.

Summary

Alternative A would continue the current level of impacts, as well as future incremental impacts to scenic quality because it would allow the highest level of motorized cross-country travel. Unauthorized routes would continue to be created and would incrementally impact scenery in general.

Alternatives B and C would reduce the amount of area open to cross-country travel, and **Alternatives D and E** would eliminate such use. This would reduce some of the effects of past activities and offset some impacts from private lands. Incremental impacts, with regard to cross-country travel, from these alternatives are expected to be positive.

Alternatives B and C would increase the miles of authorized routes, resulting in a concentration of motorized use along them, particularly in areas with a high number of routes. Incremental impacts from such use may increase.

Alternative D would decrease the miles of authorized routes, also resulting in a concentration of motorized use along them, particularly in areas with a high number of routes. Incremental impacts from such use may decrease.

Alternative E would maintain the current miles of authorized routes and corresponding level of impacts. Use would also be concentrated along these routes, similar to Alternatives B, C, and D. Impacts from this use are expected to stay at the same level, or increase incrementally.

Cumulative Effects

The geographic scope of the cumulative effects analysis selected is the entire Forest. There are some general similarities that are common to the scenery resource on lands administered by other agencies including Custer State Park and units of the National Park Service. A temporal scale of 10 years is based on (1) the time over which one can expect to predict reasonably foreseeable actions, and (2) the time over which one can expect to predict effects of ongoing and proposed activities.

The cumulative effects analysis for the scenery resource generally considers impacts of the alternatives when combined with past, present, and foreseeable future actions and events including: (1) designated Forest transportation facility maintenance; (2) closure or rehabilitation efforts on routes not open for public use or not maintained for administrative use; (3) vegetation treatments to meet timber and fuels reduction objectives; (4) urban interface growth and increased Forest use; and (5) future road or trail realignment, reconstruction, or decommissioning. Management actions can influence or contribute to changes in user concentrations, creation of unauthorized routes, maintenance needs and levels, the effectiveness of closures, and rehabilitation or some level of recovery of closed routes. Cumulatively, these actions can influence overall maintenance of, or return toward, a natural appearing condition.

The designation of a transportation system does not limit the ability of the Forest to use Closure Orders to close an area or trail if unacceptable resource damage is identified. This management

tool can limit the duration and extent of undesirable resource impacts that are beginning to occur. Effects to the scenery resource, such as loss of vegetation – creating visual lines across the landscape, and soil erosion – which create color contrasts that dominate the landscape, may be reason to issue closure orders if corrective actions are not successful.

The urban interface along the northeastern portion of the Forest, from Spearfish to Hill City, is one of the rapidly growing areas in the State of South Dakota. The rapid growth has likely contributed to the popularity of off-highway vehicles. The demand for motorized recreation will likely continue to increase (see Chapter 1). Therefore, it can generally be anticipated that demand would continue to concentrate or increase use levels on open routes (see Chapter 1) within this general area. With the reduction in miles of routes open to these vehicles, use and visual impacts will be concentrated along these routes. However, it is assumed that by reducing the number and miles of routes, inspections and maintenance of routes would address identified areas of concern in a timely way and impacts to the scenic resources would be kept to a minimum.

Implementing this travel management decision, which could potentially concentrate use, would cause a need for ongoing maintenance, and there may be a need for rerouting the location of some facilities and/or rehabilitating some routes. Rehabilitation activities, beyond normal maintenance, usually require additional environmental analysis (specific to the location), and those decisions could result in disturbance activities that may be highly evident (such as obliterating a road and returning the landscape to the natural topographic contours). However, the long-term effects of rehabilitation actions would generally be expected to reduce impacts to scenic resources, and help to reduce evidence of human-built routes across the landscape.

Activities such as vegetation management, fuels management, livestock grazing, recreational activities, and other management activities have occurred and would continue to occur on the Forest. These activities would likely occur on adjacent private lands as well. All may affect scenery by changing the natural and human-built environment. Road construction, reconstruction, and decommissioning conducted as part of managing the Forest-designated transportation system are expected to continue. These activities would generally be expected to have various levels of effects to scenery, as has been identified in the Forest Plan EIS (USDA Forest Service 1996) and in the Phase II Amendment EIS (USDA Forest Service 2005).

As indicated in the Direct and Indirect Effects section above, implementation of any of the action Alternatives (B, C, D, and E) would be expected to reduce the amount of area open to cross-country travel as compared to Alternative A. Rehabilitation of existing unauthorized routes or other disturbed areas associated with current OHV use is not a part of the proposed action or alternatives. Rehabilitation efforts at disturbed locations may occur through the implementation of future Forest projects. Over time, various disturbed areas could generally be expected to establish some level of vegetation and reduce visible effects and evidence of past OHV use. Some locations with no remaining surface soil layers, or which are compacted from vehicle use, may no longer be able to readily support vegetation establishment. In addition, the road template of constructed routes will continue to be evident, unless obliterated through rehabilitation efforts, for decades to come (in some areas the road template has been evident for some 100 years, before natural processes can finally act to reclaim it).

Management of national and state parks adjacent to the Forest (Wind Cave National Park, Jewel Cave National Monument, Custer State Park) emphasizes recreational opportunities in scenic landscape settings. National parks and monuments tend to be managed to preserve natural conditions, using fire and other processes. This would likely provide conditions under which

hardwoods and other habitats evolved. Management in national and state parks would likely contribute to the conservation of wildlife species. All of this would provide for variety in, and enjoyment of, the scenery.

On lands managed by the Black Hills National Forest, most of the riparian areas (where many of the hardwood, aspen, and meadows are most evident) are under private ownership. Development is expected to continue on private lands. While the Forest would take actions under all alternatives that would generally improve scenery in riparian areas, some actions on privately held lands could have an offsetting effect.

Table 43. Motorized use in total miles by all scenic integrity objectives

	Miles by Alternative				
	A	B	C	D	E
Very High SIO	0	0	0	0	0
High SIO	334	377	394	264	334
Moderate SIO	1,325	1,487	1,602	1,166	1,325
Low SIO	1,919	2,081	2,172	1,600	1,919
Very Low SIO	28	29	29	22	28
Other Ownership	169	155	155	145	169
Other Public Roads within NFS Lands	820	820	820	820	820
Unauthorized Routes on NFS Lands	4,375	0	0	0	0
Total	8,970	4,949	5,172	4,017	4,595

Cultural Resources

Introduction

This section presents the results of cultural resource inventories as part of the Section 106 process of the National Historic Preservation Act (NHPA) Under the guidance provided in Forest Service policy for *NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use* prepared by the Forest Service in consultation with the Advisory Council on Historic Preservation, only certain elements of the 2005 Travel Management Rule are to be considered undertakings with the potential to affect historic properties, triggering evaluation under Section 106 of NHPA, and 36 CFR Part 800. These categories are as follows:

- The construction of a new road or trail.
- The authorization of motor vehicle use on a route currently closed to vehicles.
- The formal recognition of a user-developed (unauthorized) route as a designated route open to motor vehicles.
- Closing a route currently open to motorized use. (For this decision, no proposed road closures would be implemented on the ground. Any road proposed for closure would not be designated as open to motorized travel on the map. There would be no ground disturbance and therefore no potential to affect historic properties. In the future, if physical closures (gates, berms, etc.) are proposed the districts would determine how the road would be closed and consultation would be handled with a separate 106 report.)

Existing, formally established system (classified) roads and trails including up to a 300-foot game retrieval and dispersed camping corridor, already open to motor vehicle travel, generally do not need to be reevaluated for purposes of this rule. Their designation on a motor vehicle use map is not generally considered an undertaking for the purposes of NHPA and not subject to Section 106 review. Tracts of private property within the analysis area were not inventoried.

Applicable Laws, Regulations, Policy, and Forest Plan Direction

Forest Service Policy (FSM 2361.3) requires that projects with the potential to affect cultural resources, including lands that will leave federal agency control through sale or exchange, be surveyed for cultural resources in order to comply with 36 CFR 800 –Protection of Historic Properties, Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended; the Archaeological Resources Protection Act (ARPA) of 1979, the National Environmental Policy Act (NEPA), the Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act of 1978. To comply with these laws, identified historic properties known to be 50 years or older, will be documented to State Historic Preservation Office standards, evaluated for eligibility to the National Register of Historic Places (NRHP), and assessed for potential adverse effects from the proposed action alternatives. If eligible cultural resources cannot be avoided by project activities, adverse effects will be mitigated.

Affected Environment:

Prehistoric Context. The Black Hills are part of the greater culture area of the Northwestern Plains (Sundstrom 1989). Human occupation of this area has been divided into six broad cultural periods (Frison 1991):

- Paleo-Indian 11,500 B.P. to 7,000 B.P.
- Early Archaic 7,000 B.P. to 5,000 B.P.
- Middle Archaic 5,000 B.P. to 3,000 B.P.
- Late Archaic 3,000 B.P. to 1,500 B.P.
- Late Prehistoric 1,500 B.P. to 500 B.P.

The Black Hills National Forest Cultural Resources Overview identifies cultural sites that represent all of the above prehistoric phases of occupation in the Black Hills (Rom, et al. 1996). Identifiable tribal groups living within the Black Hills area during the Protohistoric period include the Kiowa, Crow, Arapaho, Cheyenne, and Sioux.

Historic Context. Historical chronological stages appropriate for the entire Black Hills are as follows:

- Protohistoric A.D.1600-1851
- Military Exploration 1851-1874
- Euro-American Settlement 1874-1920
- Depression/New Deal 1920-1941
- World War II 1941-1945
- Modern 1946 to present

Sporadic use of the Black Hills by Euro-Americans began in the early 1800s and consisted mainly of fur trappers and traders (Sundstrom 1989). The western half of South Dakota, including the Black Hills, portions of southern North Dakota, and nearly the entire area of the Powder River Basin in Wyoming and Montana were recognized as unceded Indian Territory by the 1868 treaty between the United States and the Sioux and Arapaho. More intense Euro-American occupation in the Black Hills began shortly after gold was discovered in the Black Hills in 1874. It was this discovery that brought a full-scale influx of Euro-American prospectors and miners to the Black Hills.

In addition to gold, several other minerals began to be extracted from the Black Hills in the late 19th and early 20th centuries. These minerals were largely contained in the pegmatite dikes exposed throughout the Black Hills. These pegmatite dikes typically form resistant ridges and were mined from the surface. Typically, the rock was blasted from the pegmatite dikes using dynamite placed in either hand or machine drilled holes. The blasted rock was then sorted by hand and transferred to other locations for processing. After mining was complete, the extraction of rock typically left small open pits or cuts where the pegmatite dikes were once present.

Historic settlement in the Black Hills by Euro-Americans is generally auxiliary to this history of the mining industry. Homestead patents are common from the late 1800s through the 1920s. Industries such as the ranching and logging industry became common in the early 1900s; however, much of the land was not patented and remained public land.

Field Surveys

Level I inventories (literature search) of previous projects and previously recorded sites within the project area were conducted prior to any potential fieldwork. Level I inventories revealed there have been 1,674 Level III cultural resource surveys conducted on the Black Hills National Forest, covering significant portions of the Travel Management Analysis Project area. Adequate Level III surveys are defined as 100 percent survey requiring a visual inspection of the project APE (Area of Potential Effect), with pedestrian transects no more than 30 meters (100 feet) apart [Guidelines for Cultural Resource Surveys and Survey Reports in South Dakota (For Review and Compliance), 2005: 9]. The State of South Dakota guidelines (Ibid 2005:9) also state that the survey report must explain survey methodology and rationale for their use to be considered adequate. Furthermore, the South Dakota State Historic Preservation Office (SHPO) “has determined that archaeological data, surveys, and reports completed within the last twenty years are valid and may not require a new survey” (ibid. 2005: 9).

Separate Level I and III cultural resource inventories were conducted on each of the four districts for the Black Hills National Forest Travel Management Analysis Project. These inventories were conducted in September, October, and November 2008. These surveys are described in detail in the Heritage Resources specialist report, found in the project file. Provided that the site-specific protection measures are adhered to, these reports satisfy the requirements for consultation under Section 106 of the NHPA.

Environmental Effects Analysis

Direct and Indirect Effects

Alternative A

If there is no federal action, then there is no undertaking, as defined in 36 CFR Part 800.16(y), for Section 106 of the National Historic Preservation Act (16 U.S.C. 470f). CEQ guidance

clarifies that the no action alternative be based on no change from current management. At this time, there are 10,279 miles of existing routes on the Forest. Under this alternative, current management plans would continue to guide project area management. Unrestricted off-road motorized travel would continue to be allowed on much of the forest, consistent with the current Forest Plan.

Direct Effects - No roads, trails, or areas would be designated open to wheeled motorized vehicle travel on lands administered by the Forest; consequently, unrestricted cross-country travel and route proliferation would still occur in areas of the Forest. The no action alternative would not directly affect cultural resources through any activity proposed for travel management.

Indirect Effects - An indirect effect could possibly result from the fact that the no action alternative would not provide for any mitigation measures for resource protection, or stabilization of currently affected sites. Currently, there are 575 cultural resources in the area of potential effects for unauthorized, user-created trails. In addition, there are 1,489 sites in the area of potential effects for dispersed motorized camping, and 1,892 sites in the area of potential effects for motorized game retrieval. As stated above, these sites have had no resource protection measures implemented to prevent site damage. The effects of soil compaction, rutting, erosion, structural damage, illegal artifact collecting, and vandalism will continue—and likely increase—under the current management plan. The no action alternative would result in continued degradation of known sites. Loss of site integrity, site artifacts, and site information would continue and likely increase as unauthorized motorized recreation use grows on the Forest.

Alternative A would have the most impacts to cultural resources because it is the only alternative that would allow unrestricted motorized cross-country travel to occur on cultural resources without any form of site protection. This could lead to more user-created routes where the effects to cultural resources are not considered.

Alternative B

Alternative B attempts to comply with the Travel Management Rule and is based largely on input from the National Forest Advisory Board and Travel Subcommittee as well as the citizens, who attended the public meetings and workshops. The emphasis of Alternative B is to develop a motorized recreational system, while considering natural resource and socioeconomic concerns. Alternative B attempts to a lesser degree to maximize the effectiveness of limited resources through system design.

Alternative B has a total of 4,129 miles open to motor vehicle use. Existing system roads make up 3,466 of these miles and are not considered undertakings requiring Section 106 review. Actions that are considered undertakings subject to Section 106 review total 1,094 miles:

- Designate an open road as closed on the map 267 miles
- Reopen a closed Road 224 miles
- Trail converted from road 207 miles
- New route from unauthorized route 396 miles

Direct Effects – There are 203 historic properties in the area of potential effects (APE) under Alternative B. Actions proposed under Alternative B that have the potential to adversely impact cultural resources include the designation of new routes, reopening previously closed routes, designating a 100-foot motorized dispersed camping corridor along certain new and reopened

routes, and designating a 300-foot motorized game retrieval corridor along certain new and reopened routes. Seventy-three (73) sites lie within the area of potential effects (APE) for new and reopened routes. Eighty-four (84) sites are located in the APE for dispersed motorized camping along new and reopened routes. One hundred four (104) sites are within the APE for motorized game retrieval along new and reopened routes. Mitigation plans have been developed for each site. The appropriate State Historic Preservation Offices, Tribal Governments, and other consulting parties must concur on these plans prior to implementation. Site-specific mitigation measures are detailed in the Heritage specialist report, located in the project file (see also Appendix B).

Actions proposed under Alternative B that have the potential to benefit cultural resources include the closure of existing routes. In addition, the conversion of roads to trails would result in decreased impacts to cultural resources. Twenty-seven sites are situated on roads that will be converted to trails under Alternative B. Road closures under this alternative would eliminate motorized vehicle impacts to 35 sites. Moreover, road closures would remove 45 cultural resources from the dispersed motorized camping area of potential effects, and 62 sites from the motorized game retrieval APE. Sites that would benefit by road closures and the conversion of road to trails as proposed in Alternative B are described in detail in the Heritage specialist report, located in the project file.

Indirect Effects - Closing roads to motorized access may impair American Indian access to spiritual and traditional sites and traditional use areas. To date, no tribes have expressed concerns regarding motorized access during ongoing consultation.

Alternative C

This alternative would allow wheeled motorized travel on 4,353 miles. Of these routes, 3,582 are existing system roads and are not considered undertakings. Actions that are considered undertakings subject to Section 106 review total 1,346 miles:

- Designate an open road as closed on the map 282 miles
- Reopen a closed road 331 miles
- Trail converted from road 205 miles
- New route from unauthorized route 527 miles

Direct Effects – There are 269 historic properties that lie in the area of potential effects (APE) under Alternative C. Actions proposed under Alternative C that have the potential to adversely impact cultural resources include the designation of new routes, reopening previously closed routes, designating a 300-foot motorized dispersed camping corridor along certain new and reopened routes, and designating motorized game retrieval areas totaling 373,000 acres. Ninety-five (95) sites are in the area of potential effects for new and reopened routes. One hundred forty (140) sites are in the APE for dispersed motorized camping along new and reopened routes. One hundred eighty-five (185) sites are in the APE for the motorized game retrieval areas. Mitigation plans have been developed for each site. These plans must receive concurrence from the appropriate State Historic Preservation Offices, Tribal Governments, and other consulting parties prior to implementation. Site-specific mitigation measures are detailed in the Heritage specialist report, located in the project file (see also Appendix B).

Actions proposed under Alternative C that have the potential to benefit cultural resources include the closure of existing routes. In addition, the conversion of roads to trails would result in decreased impacts to cultural resources. Some 21 sites are on roads that would be converted to

trails under Alternative C. Road closures under this alternative would eliminate motorized vehicle impacts to 52 sites. Moreover, road closures would remove 83 cultural resources from the dispersed motorized camping area of potential effects. Sites that would benefit from road closures and the conversion of road to trails as proposed in Alternative C are described in the Heritage specialist report, located in the project file.

Indirect Effects - Closing roads to motorized access may hamper American Indian access to spiritual and traditional sites and traditional use areas. However, no such concerns have been raised during consultation with affected tribes.

Alternative D

Alternative D would provide a smaller motorized transportation system with fewer motorized trails. This alternative would reduce the impacts of motorized use to nonmotorized recreationists and natural resources. This alternative would offer a designated travel system that would limit impacts on wildlife habitats and natural resources. Dispersed motorized camping and motorized game retrieval would not be permitted under this alternative.

This alternative would allow wheeled motorized travel on 3,196 miles. Existing system roads make up 2,877 of these miles and are not considered undertakings requiring Section 106 review. Actions that are considered undertakings subject to Section 106 review total 1,234 miles:

- Designate an open road as closed on the map 830 miles
- Reopen a closed road 90 miles
- Trail converted from road 146 miles
- New route from unauthorized route 168 miles

Direct Effects – There are 167 historic properties that are known to exist within the area of potential effects under Alternative D. Actions proposed under Alternative D that have the potential to adversely impact cultural resources include the designation of new routes, and reopening previously closed routes. Some 34 sites are in the area of potential effects (APE) for new and reopened routes. Mitigation plans have been developed for each site and concurred upon by applicable State Historic Preservation Offices, Tribal Governments, and other consulting parties. Site-specific mitigation measures are detailed in the Heritage specialist report, located in the project file (see also Appendix B).

Alternative D includes actions that have the potential to benefit cultural resources, such as the closure of existing routes. Alternative D road closures would eliminate motorized vehicle impacts to 123 sites. The conversion of roads to trails also should result in decreased impacts to cultural resources. Ten (10) sites are located along roads that will be converted to trails under Alternative D. Sites that would benefit by road closures and the conversion of road to trails as proposed in Alternative B are described in the Heritage specialist report, located in the project file. Alternative D would reduce impacts the most by having the least amount of area open to cross-country travel and the least miles of motorized routes.

Indirect Effects - Closing roads to motorized access may impair American Indian access to spiritual and traditional sites and traditional use areas. However, tribal representatives have expressed no concerns over this during consultation.

Alternative E

Direct Effects - Alternative E would take the minimum actions required to comply with the Travel Management Rule. It eliminates off-road travel in areas where it is currently allowed. Under Alternative E, motorized travel would be restricted to designated routes. It adopts the current road and trail system as the designated travel system. This alternative would not allow motorized dispersed camping or game retrieval.

Alternative E would allow wheeled motorized travel on the 3,740 miles of existing system roads. No cross-country motorized travel would be allowed. Designation of these routes on a map would not be considered undertakings requiring Section 106 review. Alternative E would not directly affect cultural resources through any activity proposed for Travel Management. However, Alternative E would indirectly benefit cultural resources by eliminating the effects of motorized dispersed camping and motorized game retrieval that may be currently occurring. This indirect effect would remove all sites from the dispersed camping APE, and all sites from the motorized game retrieval APE.

Indirect Effects - Closing roads to motorized access may hamper American Indian access to spiritual and traditional sites and traditional use areas. However, no such concerns have been raised during consultation with affected tribes.

Effects Common to All Action Alternatives

Alternatives B, C, and D have the potential to negatively affect at-risk historic properties due to the presence of eligible and unevaluated sites located along routes. It is likely that a long-term result of reducing or eliminating cross-country travel under these alternatives would be an increased and more intensive use of the designated system. There is also a concern for cultural resource sites not yet discovered due to such factors as dense vegetation and those sites that are comprised of buried deposits (such as lithic scatters). However, because Alternatives B, C, and D reduce or prohibit unauthorized public wheeled motor vehicle cross-country travel, they reduce the potential for adverse effects to cultural resources. Thus, these alternatives should have an overall benefit to cultural resources.

Alternatives B, C, D, and E would reduce the amount of area open to cross-country travel, thereby reducing its ongoing effects and offsetting some impacts from lands of other ownership. Incremental impacts to cultural resources from these alternatives are expected to be positive.

Alternatives B, C, and D, would concentrate motorized travel within restricted road corridors. This concentration would make the potential for effects to cultural resources in these areas more severe. However, this potential for effects would be managed through site-specific protection measures in consultation with affected State Historic Preservations, affected tribes, and the Advisory Council for Historic Preservation.

The proposed Travel Management Plan could have both beneficial and adverse effects on American Indian traditional resources. Beneficial effects could include an increase in the feeling of solitude and an enhancement of the resource setting for traditional-resource areas. At the same time, road closures could limit access to American Indian traditional-resource locations. The American Indian Religious Freedom Act reinforces the policy of providing access and use of Forest lands to American Indians for traditional rites and ceremonies. The Forest Service would continue to consult with American Indian groups to identify and resolve potential access and traditional-use issues under all alternatives.

Cumulative Effects

Past, Present, and Reasonably Foreseeable Actions

Past, present, and reasonably foreseeable future activities within analysis area include timber harvest, recreation, road construction, range improvement projects, mining activities, and associated improvement projects. These activities have occurred in the past, are ongoing, and in all likelihood will continue to occur in the foreseeable future. NHPA Section 106 and 36CFR800 outline methods for protecting cultural resources from impacts caused by the actions listed above. These impacts are difficult to quantify, but they can be avoided or minimized through the implementation of appropriate site-specific mitigation measures through consultation with the State Historic Preservation Officer (SHPO), Tribal Governments, and the Advisory Council on Historic Preservation.

It is recognized that cultural resources may be present in the subsurface with no surface manifestation. Therefore, if additional cultural resources are discovered during project activities, all operations must cease within a 100-meter radius of the site location and a district archeologist notified immediately. Any cultural resources located during project implementation would be protected based on the recommendations of the district archeologist and the SHPO. All sites would be evaluated under the terms specified in 36 CFR Part 60.4 and 36 CFR Part 800 and applicable Forest guidelines (FP Guidelines 4102, 6101, 6106).

Cumulative Effects

The effects of timber harvest, recreation, road construction, range improvement projects, mining activities, and development have a cumulative impact to cultural resources if they are not properly managed. All of these activities may have a cumulative effect on heritage resources in the form of soil erosion, soil compaction, soil disturbance, increased visitor use and traffic, and vandalism.

These impacts are not restricted to lands administered by the Black Hills National Forest. They occur on private, State, and other federal lands within and adjacent to the Forest, with varying degrees of consideration for cultural resources. These impacts are difficult to quantify, but they can be avoided or minimized through the implementation of appropriate site-specific mitigation measures through consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation.

Cultural resources are known to exist on privately owned inholdings within the Forest boundary. However, most cultural resource protection laws apply only to federal undertakings. Consequently, resource extraction (e.g., logging and mining), subdivision development, road construction, and the outright extraction of cultural resources for personal or commercial gain on private lands occurs with little or no regard for cultural resources. It is assumed that urban development would continue on private lands, which could lead to more roads and additional disturbance to cultural resources. This cumulative effect would likely increase the importance of cultural resources located on National forest System land.

Management of national and state parks such as Custer State Park, Wind Cave National Park, and Jewel Cave National Monument adjacent to the Forest tends to positively affect cultural resources. These parks contain large numbers of cultural resources. Management of cultural resources at these parks is governed by the same laws that protect cultural resources on Forest lands. Furthermore, these parks emphasize nonmotorized recreational opportunities and would likely manage cultural resources for the benefit of the resource, and the edification of the

citizenry through site interpretation where appropriate. Management in national and state parks would likely contribute to the protection of cultural resources.

Cumulative effects for heritage resources result from the incremental impact (direct and indirect effects) associated with the alternatives when added to other past, present, and reasonably foreseeable actions. It is anticipated that future travel management activities would not affect cultural resources to a significant degree as these projects would be subject to NHPA Section 106 compliance and would include protection measures in their design and implementation. Monitoring of site conditions would continue in support of travel management. Mitigation of potential effects to heritage resources from continued recreational use of the designated routes would be achieved through consultation with the SHPOs and tribes.

Consultation

Consultation is currently underway with the South Dakota and Wyoming State Historic Preservation Offices and the appropriate Tribal Historic Preservation Offices of the involved tribes. SHPO and tribal consultation must be completed prior to implementation of the Travel Management Plan.

Range and Weeds

Introduction

This project is Forest wide in scope and affects the range program on all 4 Ranger Districts. The Black Hills is a highly productive area from the standpoint of forage resources with an average of approximately 466 million pounds of forage produced across the Forest each year. At an average proper-use level of 50 percent, up to 233 million pounds of forage is available for harvest each year by livestock and wildlife (USDA Forest Service 1996).

Applicable Forest Plan Direction

Several goals, objectives, standards, and guidelines, both Forestwide and specific to selected management areas for rangelands and range management are in the current forest plan. Though they all pertain to our planning effort, we will deal with those that address travel management most directly.

- Forestwide Objective 301 says, “Produce on a sustained basis and make available up to 233 million pounds of forage for livestock and wildlife use each year (weather permitting).
  a. Livestock use will be up to 127 million pounds of forage per year or approximately 128,000 AUMs.
  b. Wildlife use will be up to 106 million pounds of forage per year or approximate population levels of 70,000 deer and 4,500 elk or other combinations that use the same amount of forage.”
- Forestwide Objective 302 says maintain rangelands in satisfactory range condition.

Methodology

In this analysis framework, the focus of the analysis is on the potential effects to livestock grazing operations and rangeland resources. Operations on allotments can be affected by travel management in a variety of ways including impacts to livestock use, health, and distribution

patterns, allotment improvements, and rangeland health. Two indicator measures were developed to analyze and compare the degree to which the alternatives may result in effects. These are miles of roads and acres with unrestricted access.

Indicators

- Miles of roads
  - Total miles of road relates to the route density across the Forest and within grazing allotments and is an indicator of multiple effects that result from motorized vehicle routes. Associated with increased route density there is an increase in public access and a corresponding increase in a wide range of associated human activities outside developed use areas. Route density increases access to areas for recreation such as dispersed camping, picnicking, hunting, OHV riding, and related activities.
  - Increased route density reduces areas for livestock to avoid vehicle and human interactions. Vehicle access and associated human uses sometimes leads to effects on livestock such as inadvertent spooking and livestock running from perceived danger as well as some intentional chasing by motorized vehicle users. These conditions sometimes lead to altered grazing use patterns, livestock stress, weight loss and related health problems.
  - Dispersed camping and other associated uses such as game retrieval, OHV riding and trail heads are sometimes concentrated in watering and high forage locations which may lead to changed livestock use patterns and avoidance of some forage areas.
  - Routes open for public motor vehicle use reduce forage availability on allotments because vegetation is not available on route beds that remain open. Associated uses such as dispersed camping off routes and game retrieval may also impact vegetation and reduce available forage (USDA Forest Service 2008).
- Acres accessible
  - Unrestricted access (open cross-country travel) allows access to management gates (those not on road and trails) furthering the opportunity for unauthorized livestock movement into areas outside the prescribed pastures. The access increases the likelihood of gates left open or damaged, allowing livestock to move off the allotment or to enter pastures ahead of schedule or return to those already grazed, areas too wet for grazing, or road corridors. This can lead to vegetation, soil, or water quality concerns and vehicle collisions.
  - Unrestricted access through meadows within grazing allotments can affect the amount and condition of forage and livestock use patterns. Forage availability can be reduced because vegetation is not available in areas where unrestricted access has affected the forage. The impact to grazing is intensified when routes affect meadows, which are primary forage areas. Livestock sometimes reduce use in areas in response to human presence, which may cause change in utilization of primary forage.
  - Unrestricted access through meadows have the potential to affect the ecological condition which could result in a loss of productivity of primary forage areas and water sources and reductions in forage available for by both livestock and wildlife utilization (USDA Forest Service 2008).

Assumptions

For this analysis, the following assumptions were applied:

- Public education and enforcement of regulations will generally limit public travel to designated routes.
- Administrative access is allowed for official Forest Service business including contractors and permit holders.
- The effects analysis assumes that the design criteria will be implemented for the chosen alternative.

No special field surveys were conducted for this specific project. Knowledge of the field resources comes from many years in the field implementing and reviewing projects on this Forest. A GIS mapping exercise was used to overlay the resource with the alternatives, examine the benefits and locate possible conflicts.

Affected Environment

Of the 233 million pounds of forage available for harvest on the Black Hills, 127 million pounds found in designated allotments is allocated to permitted livestock under Forest Plan direction. The remaining 106 million pounds is retained for use by various wildlife species. The non-harvested production (233 million pounds) is for long-term ecosystem health and sustainability, visual quality, flash fuel for planned fire use, and so forth (USDA Forest Service 2005a). There are approximately 128,000 animal unit months (AUMs) in the designated 135 allotments (USDA Forest Service 1996) allocated for livestock under term grazing or other permits.

Environmental Effects Analysis

Direct and Indirect Effects

Alternative A

This alternative would continue the current effects of traffic of all kinds on the Forest to the resource. This truly is a no change alternative, except without the overall restriction on travel new unauthorized routes and trails would continue to be pioneered. This would mat down and take out vegetation and add to the harassment of livestock, neither of which moves us closer to the goals and objectives of the Forest Plan. This alternative contains the highest concentration of roads when unauthorized routes are considered and allows unrestricted access to the highest number of acres.

Alternatives B, C, D, and E

In the following order, Alternatives C, B, E, and D would result in progressively lower densities of motorized routes on National Forest System lands and unrestricted access to fewer acres, with C having the most and D the least. Trailheads differ slightly with Alternative C, B, and D in decreasing order of the number of trailheads and effect to the resource, and Alternative E having the current number of trailheads. All alternatives reduce motorized routes from Alternative A when the unintended routes are considered (Table 44). These reductions would have a beneficial effect on livestock management, range resources and grazing management in the following ways:

- The potential effects on range management and access to developments were evaluated. Guideline 9104 is common to all alternatives and states motorized vehicles may be used on

restricted areas and roads to accomplish administrative purposes. Therefore, motorized vehicle access to range developments or to administer allotments and manage livestock would be the same for the action alternatives (B, C, D, or E) as it is for current management (Alternative A).

- The alternatives that have additional trailheads, new routes or the opening of closed routes could affect allotment administration and livestock management in a localized area but is unlikely to have long-term negative impacts.
- The dispersed camping corridor on each side of the road where it exists is considered in this analysis in the acres of the unrestricted access and considered in each alternative.
- Game retrieval in some alternatives and administrative access although allowing off-road access would reduce the extent and timing of that access. The extent would be minimal and timing much more controlled as compared to the current and expected future unrestricted use.
- The miles of routes are a direct tie to weed spread thus reducing quality and quantity of forage due to the competition between invasives and other vegetation (see the Invasive Plants discussion for additional information).
- **Alternative B:** In Table 44 the indicators shows that Alternative B has fewer total miles of road, trailheads and less acres of unrestricted access than Alternative C, but more of each than D or E. This puts B in the middle of the pack being an improvement over Alternative A.
- **Alternative C:** As stated, all action alternatives are an improvement over the existing situation. Alternative C has the least positive effects as you look at the indicators due to the total miles of road, trailheads and the accessible acres through dispersed camping and game retrieval (see Table 44).
- **Alternatives D and E:** The indicators in Table 44 show that the effects of Alternatives D and E would be very similar. Alternative D has the most positive effect with fewer road miles and Alternative E is second. Both of these alternatives have less miles of road than the other alternatives, but the real benefit is the lack of acres available for unrestricted access as shown by the second indicator. There are more trailheads in Alternative D than in E but Alternative D would likely still have the most positive effect.

Table 44. Comparison of indicator measures and alternatives for range

Indicators	A	B	C	D	E
Miles of FS roads	3,775	4,129	4,352	3,197	3,776
Unauthorized route miles	4,109	0	0	0	0
Total Miles of Roads	8,151	4,129	4,352	3,197	3,776
Acres accessible Dispersed Camping	864,000	63,000	184,000	0	0
Acres accessible Game retrieval	864,000	179,000	373,000	0	0
Trailheads	7	31	34	23	7

Cumulative Effects

Cumulative effects as discussed here are effects on the resource that result from incremental impacts of actions when added to the past, present, and reasonably foreseeable future actions. This includes the Forest and the adjacent lands. Each travel management action alternative would result in beneficial effects to varying degrees; however, the nature, extent, duration, and intensity of these effects would likely vary across alternatives. Harvest and fuels management projects are expected to provide beneficial effects to allotments. In some instances, such as

where conifer canopy is opened up or removed entirely, there may be an increase in herbaceous vegetative productivity and complexity, thereby benefiting both the plant community and potentially providing increased forage productivity for wildlife and livestock. There may also, be some short-term adverse effects to livestock management during project implementation such as impacts to fencing or gates and changes in livestock distribution patterns. The forage available on the Forest has likely increased in the recent years from fires that have affected the Forest landbase and the canopy cover that has been reduced by mountain pine beetle. These cumulative disturbances could be expected to benefit the amount of forage that is available to livestock use on the Forest currently and for several years out.

Grazing allotment management plans for allotments are proposed to be revised to incorporate current standards. These proposed actions are expected to move allotments towards desired conditions. Present treatment of noxious weeds is beneficial to rangeland health with a long term beneficial effect to forage availability. Foreseeable future recreation projects are expected to have minor effects to grazing. Other projects such as meadow restoration are expected to have beneficial effects.

Invasive Species (Noxious Weeds)

Introduction

This project is Forestwide in scope and affects the invasives program on all four ranger districts. Noxious weeds are typically non-native plants that adversely affect native plant communities by aggressively competing for nutrients, water, and sunlight. As a result, sensitive plants, forage quantity and quality, and soil stability are negatively impacted. Background information regarding the status of noxious weeds on the Forest is presented in the 1996 Final EIS (USDA Forest Service 1996) and the Final Environmental Impact Statement for the Phase II Amendment (USDA Forest Service 2005a).

Invasive species are one of the four threats because of the alarming rates of spread and they are adversely affecting people and the ecosystem. In the U.S., there are 2,000 non-native plants, about 400 of which are invasives. Invasive plants now cover about 133 million acres in all ownerships nationwide and are marching at the rate of about 1.7 million acres per year. About 3.5 million acres of National Forest System land are infested. They have invaded grasslands, which lose their livestock carrying capacity and wildlife habitats are destroyed (USDA Forest Service 2004b).

Applicable Forest Plan Direction

Several goals, objectives, standards, and guidelines, both Forestwide and specific to selected management areas for invasives are in the current forest plan. Though they all pertain to our planning effort, we will deal with those that address travel management directly.

- Forestwide Objective 231 is intended to prevent new infestations and reduce established noxious-weed infestations. Treat at least 8,000 acres per year during the next 10 years to limit noxious weed infestations.
- Forestwide Standard 4301 requires managers to determine noxious weed introduction or spread risk and implement appropriate mitigation measures for all proposed projects or activities.

Methodology

In this analysis framework, the focus of the analysis is on the potential for invasive weed spread and disturbance effects by the different alternatives. Two indicator measures are used to analyze and compare the degree to which the alternatives may result in effects. These are miles of roads and acres with unrestricted access.

Indicators

- Miles of roads
  - Road shoulders are particularly susceptible to weed invasion. Road construction and maintenance activities mix soil layers, increasing soil microbial activity. Weeds exploit these newly available nutrients efficiently (Best et al. 1980, Belcher and Wilson 1989). This may be one reason that the density of weedy plants increases as the intensity of soil disturbance increases (Jensen 1995). Parendes and Jones (2000) found that the presence of exotic plant species was highly correlated with sunlit soil and frequent, severe disturbances, like those resulting from road traffic and road maintenance activities such as grading.
  - Road corridors are prolific sources of weed seeds that may be carried to other locations (Tyser and Worley 1992) or that may colonize adjacent vulnerable habitats. Vehicle undercarriages can trap and transport weed seed (Sheley and Petroff 1999). A study in Kakadu National Park in Australia found that weed seed was transported into the park on tourist vehicles and was more likely to be transported by four-wheel-drive vehicles that had been driven off-road (Lonsdale and Lane 1994). A review of literature shows that native plant cover and species diversity increase with distance from routes, while the presence of exotic species declines with increased distance from road (Gelbard and Harrison 2003; Tyser & Worley 1992; Frenkell 1970; Johnson et al. 1975). Thus, plant communities adjacent to more improved roads (e.g. paved, gravel) that receive high vehicle traffic might be expected to be more invaded than those adjacent to infrequently used primitive roads (e.g., four wheel-drive tracks) (Parendes and Jones 2000).
  - A number of mechanisms have been proposed as explanations for these patterns. Vehicles and road-fill operations transport exotic plant seeds into un-infested areas, and road construction and maintenance operations provide safe sites for seed germination and seedling establishment (Schmidt 1989; Lonsdale and Lane 1994; Greenberg et al. 1997; Trombulak and Frissell 2000). Clearing of vegetation and soils during construction, addition of road fill, and grading of native surface roads create areas of bare and deeper soil that allow exotic seeds to become established (Frenkell 1970; Trombulak and Frissell 2000).
- Acres Accessible
  - In many respects, the affects of unrestricted access are similar to that of the road corridor discussed above. Though you do not have the construction and maintenance there is still disturbance. With cross-country travel, there is movement of seed similar to that of road corridors. Compaction is still a factor and can affect the native, less aggressive, plants.
  - Dispersed camping, game retrieval, and trailheads would allow movement of seed similar to that of road corridors. Compaction particularly in the area of trailheads is still a factor and can affect the native, less aggressive, plants.

Assumptions

For this analysis, the following assumptions were applied:

- Public education and enforcement of regulations will generally limit public travel to designated routes.
- Administrative access is allowed for official Forest Service business including contractors and permit holders.

No special field surveys were conducted for this specific project. Knowledge of the field resources comes from many years in the field implementing and reviewing projects on this Forest. A mapping exercise was used to overlay the resource with the alternatives, to locate possible conflicts and review the benefits.

Affected Environment

The Forest has implemented a Noxious Weed Management Plan (USDA Forest Service 2003a) to increase the scope of noxious-weed management. The weed management plan directs the Forest to implement prevention, education, administration, planning, and integrated control in the Forest weed management effort. The Noxious Weed Environmental Assessment (USDA Forest Service 2003a) was prepared to describe direct, indirect, and cumulative impacts concerning the weed-management plan. This section summarizes information from that document.

Forest personnel have identified approximately 170,000 acres of existing noxious weed infestations. Road construction and maintenance activities are expected to increase weed spread as can other management practices. Motorized-vehicle use is a vector for spread, as well as logging, domestic livestock and wildlife. These factors and others not listed are expected to affect approximately 7,700 acres of spread (USDA Forest Service 2003a) all disturbances can contribute to weed spread.

Environmental Effects Analysis

Direct and Indirect Effects

Alternative A

This alternative would continue the current effects of traffic of all kinds on the Forest to the resource. This is a no change alternative, except without the overall restriction of travel new unauthorized routes and trails would continue to be pioneered. This would continue the spread of weeds through seed dispersal and the current rate of disturbance and in fact increase it neither of which moves us closer to the goals and objectives of the Forest Plan. This alternative contains the highest concentration of roads and allows unrestricted access to the highest number of acres.

Alternatives B, C, D, and E

In the following order, Alternatives C, B, E, and D would result in progressively lower densities of motorized routes on National Forest System lands and unrestricted access to fewer acres with C having the most and D being the least miles and acres (Table 44, above). All alternatives reduce motorized routes from the amount in Alternative A. Trailheads differ slightly with Alternative C, B, and D in decreasing order of the number of trailheads and effect to the resource, with Alternative E having no change from the current number of trailheads and no change from the current effect. These reductions would have a beneficial effect on invasive weed spread and disturbance to create seedbeds:

- The potential effects on weed management and access for treatment were evaluated. Guideline 9104 is common to all alternatives and states motorized vehicles may be used on restricted areas and roads to accomplish administrative purposes. Therefore, motorized vehicle access to treat and monitor noxious weeds will be the same for the action alternatives (B, C, D, or E) as it is for current management (Alternative A).
- The alternatives that have additional trailheads, new routes or the opening of closed routes could affect invasive weed spread and disturbance creating seedbeds but as long as the design criteria are followed for seeding, the long-term effects should be minimal.
- The dispersed camping corridor on each side of the road where it exists is considered in this analysis in the acres of the unrestricted access and considered in each alternative.
- Game retrieval in some alternatives and administrative access although allowing virtually unrestricted access will reduce the extent and timing of that access. The extent will be minimal and timing much more controlled as compared to the current and expected future unrestricted use.
- **Alternative B:** In Table 44, the indicators shows that Alternative B has less miles of road, trailheads and less acres of unrestricted access than Alternative C, but more of each than D or E. This puts B in the middle of the pack being an improvement over Alternative A.
- **Alternative C:** As stated, all action alternatives are an improvement over the existing situation. Alternative C has the least positive effects as you look at the indicators, due to the miles of road, number of trailheads and the unrestricted acres that are accessible through dispersed camping and game retrieval (see Table 44).
- **Alternative D and E**: The indicators in Table 44 show that the effects of Alternatives D and E would be very similar. Alternative D has the most positive effect with fewer road miles and Alternative E is second. Both of these alternatives have less miles of road than the other alternatives, but the real benefit is the lack of acres available for unrestricted access as shown by the second indicator. There are more trailheads in Alternative D than in E but Alternative D would likely still have the most positive effect.

Cumulative Effects

The incremental effect of the travel management alternatives when added to the impacts from all past, present, and reasonably foreseeable future projects comprise cumulative effects. This includes the Forest and the adjacent private and public lands. Each travel management action alternative would result in beneficial effects to varying degrees; however, the nature, extent, duration, and intensity of these effects would likely vary across alternatives. The incremental effects of natural disturbances and resource-management practices on private and public lands on noxious weeds are also expected to continue. Historic resource management activities have influenced the vegetation composition and structure of the Forest and as such are encompassed in the existing conditions against which projected changes are measured for each alternative. Current public and private noxious weed management programs exist are expected to continue and likely increase in the foreseeable future within the cumulative-effects study area for travel management. The additional treatment acres from the amended Forest Plan are not anticipated to exceed acceptable thresholds to the environment or to result in long-term adverse impacts (USDA Forest Service 2005a).

Short-term Uses and Long-term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). Effects from implementation of each of the alternatives on specific resources are disclosed elsewhere in this chapter. Any of the alternatives would be implemented with design criteria to protect basic soil productivity. Decreases in long-term soil productivity from implementation of any of the alternatives are not anticipated.

The Forest Plan provides minimum management requirements for resource protection to ensure that long-term productivity is not impaired by short-term uses. Any alternative would be implemented consistent with these requirements. Project and Forest Plan monitoring would verify that protective measures are being implemented, and would continually gauge their effectiveness.

Unavoidable Adverse Effects

Some adverse effects are unavoidable with the implementation of any action alternative described in this analysis. Applying the design criteria described in Appendix B would reduce these effects to the extent possible. Effects of the alternatives to individual resources are described in detail elsewhere in this chapter. Please refer to each analysis section for details on unavoidable adverse effects.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road. Effects of implementing the alternatives are described in detail elsewhere in this chapter, but are summarized here as appropriate.

There would be **no irreversible commitments** of resources from implementation of any of the alternatives.

Irretrievable commitments of resources could include the following:

- Soil productivity and timber productivity would be lost where trail construction would occur.
- Wildlife habitat could be lost or modified for certain species under any of the action alternatives. Habitat values would recover in these areas as motorized recreation traffic is rerouted for other purposes by other decisions.
- Noxious weeds and invasive species could become established and persist under the action alternatives, if not addressed proactively or treated aggressively. The alternatives include design criteria to minimize the introduction of new occurrences of these species.
- Scenic values would be modified to some degree under each alternative.
- Recreation experiences would vary under each alternative. Motorized and nonmotorized recreationists alike would see changes to their experiences in different parts of the Forest in the form of opportunities offered and conflicts with other users.

Other Required Disclosures

NEPA at 40 CFR 1502.25(a) directs, "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders." The alternatives and analysis described herein comply with the following laws, regulations, and executive orders, as is disclosed in this document or in supporting documentation.

- Multiple Use-Sustained Yield Act of 1960
- National Historic Preservation Act of 1969
- National Environmental Policy Act of 1969
- Clean Air Act of 1970
- Clean Water Act of 1970
- Endangered Species Act of 1973
- National Forest Management Act of 1976
- Executive Order 11593-Property of Historic, Archeological, or Architectural Significance
- Executive Order 11644-ORV Management
- Executive Order 11988; 10 CFR 1022-Floodplains
- Executive Order 11989-ORV Management
- Executive Order 11990-Protection of Wetlands
- Executive Order 12898-Environmental Justice
- Executive Order 12962-Recreational Fisheries
- Executive Order 13007-Native Americans' concerns

This project does not involve impounding or diverting water, or adverse impacts to Federally listed threatened or endangered species; therefore, formal consultation with the U.S. Fish and Wildlife Service is not required.

No ground-disturbing actions would occur in known eligible historic places. The Forest Service has complied with requirements of Section 106 of the National Historic Preservation Act.

A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice. Executive Order 12898 provides that, "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." No adverse effects from the proposed action or alternatives have been identified on minority or low-income populations.

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Distribution of the Environmental Impact Statement

This environmental impact statement has been distributed to the following individuals who specifically requested a copy of the document. In addition, copies have been sent (or in some cases made electronically available) to Federal agencies, federally recognized tribes, State and local governments, and organizations that have requested to be involved in the development of this analysis. These entities include the U.S. Environmental Protection Agency; U.S. Army Corps of Engineers; U.S. Department of the Interior; Federal Highway Administration; Advisory Council on Historic Preservation; USDA National Agricultural Library; State wildlife and fisheries management agencies; County commissions; and local community governments.

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U.S. Department of the Interior
U.S. Coast Guard
Federal Aviation Administration-Great Lakes Region, and Northwest Mountain Region
U.S. Department of Energy

Appendices

Appendix A: Travel Management Rule

PART 212—TRAVEL MANAGEMENT

▪1. Amend part 212 by revising the part heading to read as set forth above.

▪1a. Remove the authority citation for part 212.

▪2. Designate §§ 212.1 through 212.21 as subpart A to read as set forth below:

Subpart A—Administration of the Forest Transportation System

▪2a. Add an authority citation for new subpart A to read as set forth below:

Authority: 16 U.S.C. 551, 23 U.S.C. 205.

▪3. Amend § 212.1 as follows:

▪a. In alphabetical order, add the following definitions: administrative unit; area; designated road, trail, or area; forest road or trail; forest transportation system; motor vehicle; motor vehicle use map; National Forest System road; National Forest System trail; off-highway vehicle; over-snow vehicle; road construction or reconstruction; temporary road or trail; trail; travel management atlas; and unauthorized road or trail; and

▪b. Revise the definitions for forest transportation atlas, forest transportation facility, and road; and

▪c. Remove the definitions for classified road, new road construction, road reconstruction, temporary road, and unclassified road.

§ 212.1 Definitions.

Administrative unit. A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land Between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System.

Area. A discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District.

Designated road, trail, or area. A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to § 212.51 on a motor vehicle use map.

Forest road or trail. A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Forest transportation atlas. A display of the system of roads, trails, and airfields of an administrative unit.

Forest transportation facility. A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system.

Forest transportation system. The system of National Forest System roads, National Forest System trails, and airfields on National Forest System lands.

Motor vehicle. Any vehicle which is self-propelled, other than:

(1) A vehicle operated on rails; and

(2) Any wheelchair or mobility device, including one that is battery powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area.

Motor vehicle use map. A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System.

National Forest System road. A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

National Forest System trail. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

Off-highway vehicle. Any motor vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain.

Over-snow vehicle. A motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow.

Road. A motor vehicle route over 50 inches wide, unless identified and managed as a trail.

Road construction or reconstruction. Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road.

Temporary road or trail. A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas.

Trail. A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail.

Travel management atlas. An atlas that consists of a forest transportation atlas and a motor vehicle use map or maps.

Unauthorized road or trail. A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas.

▪4. Amend § 212.2 by redesignating paragraphs (b) as (d), revising paragraph (a), and adding new paragraphs (b) and (c) to read as follows:

§ 212.2 Forest transportation program.

(a) *Travel management atlas.* For each administrative unit of the National Forest System, the responsible official must develop and maintain a travel management atlas, which is to be available to the public at the headquarters of that administrative unit.

(b) *Forest transportation atlas.* A forest transportation atlas may be updated to reflect new information on the existence and condition of roads, trails, and airfields of the administrative unit. A forest transportation atlas does not contain inventories of temporary roads, which are tracked by the project or activity authorizing the temporary road. The content and maintenance requirements for a forest transportation atlas are identified in the Forest Service directives system.

(c) *Program of work for the forest transportation system.* A program of work for the forest transportation system shall be developed each fiscal year in accordance with procedures prescribed by the Chief.

▪5. Amend § 212.5 as follows:

▪a. Revise paragraphs (a)(1) and (a)(2)(ii);

▪b. Revise the heading for paragraph (c) introductory text to read as set forth below:

▪c. Revise the heading for paragraph (d) introductory text to read as set forth below:

§ 212.5 Road system management.

(a) Traffic rules.

(1) *General.* Traffic on roads is subject to State traffic laws where applicable except when in conflict with designations established under subpart B of this part or with the rules at 36 CFR part 261.

(2) *Specific.*

(ii) Roads, or segments thereof, may be restricted to use by certain classes of vehicles or types of traffic as provided in 36 CFR part 261. Classes of vehicles may include but are not limited to distinguishable groupings such as passenger cars, buses, trucks, motorcycles, all-terrain vehicles, 4- wheel drive vehicles, off-highway vehicles, and trailers. Types of traffic may include but are not limited to groupings such as commercial hauling, recreation, and administrative.

(c) *Cost recovery on National Forest System roads.*

(d) *Maintenance and reconstruction of National Forest System roads by users.*

▪6. Amend § 212.7 by revising the paragraph heading and text of paragraph (a) to read as follows:

§ 212.7 Access procurement by the United States.

(a) *Existing or proposed forest roads that are or will be part of a transportation system of a State, county, or other local public road authority.* Forest roads that are or will be part of a transportation system of a State, county, or other local public road authority and are on rights-of-way held by a State, county, or other local public road authority may be constructed, reconstructed, improved, or maintained by the Forest Service when there is an appropriate agreement with the State, county, or other local public road authority under 23 U.S.C. 205 and the construction, reconstruction, improvement, or maintenance is essential to provide safe and economical access to National Forest System lands.

▪7. Amend § 212.10 by revising paragraph (d) to read as follows:

§ 212.10 Maximum economy National Forest System roads.

(d) By a combination of these methods, provided that where roads are to be constructed at a higher standard than the standard—consistent with applicable environmental laws and regulations—that is sufficient for harvesting and removal of National Forest timber and other products covered by a particular sale, the purchaser of the timber and other products shall not be required to bear the part of the cost necessary to meet the higher standard, and the Chief may make such arrangements to achieve this end as may be appropriate.

§ 212.20 **[Removed and reserved]**

▪8. Remove and reserve § 212.20.

▪9. Add a new subpart B to read as follows:

Subpart B—Designation of Roads, Trails, and Areas for Motor Vehicle Use

Sec.
212.50 Purpose, scope, and definitions. 212.51 Designation of roads, trails, and areas.
212.52 Public involvement.
212.53 Coordination with Federal, State, county, and other local governmental entities and tribal governments.
212.54 Revision of designations.
212.55 Criteria for designation of roads, trails, and areas.
212.56 Identification of designated roads, trails, and areas.
212.57 Monitoring of effects of motor vehicle use on designated roads and trails and in designated areas.

Authority: 7 U.S.C. 1011(f), 16 U.S.C. 551, E.O. 11644, 11989 (42 FR 26959).

§ 212.50 Purpose, scope, and definitions.

(a) *Purpose.* This subpart provides for a system of National Forest System roads, National Forest System trails, and areas on National Forest System lands that are designated for motor vehicle use. After these roads, trails, and areas are designated, motor vehicle use, including the class of vehicle and time of year, not in accordance with these designations is prohibited by 36 CFR 261.13. Motor vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.13.

(b) *Scope.* The responsible official may incorporate previous administrative decisions regarding travel management made under other authorities, including designations and prohibitions of motor vehicle use, in designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use under this subpart.

(c) For definitions of terms used in this subpart, refer to § 212.1 in subpart A of this part.

§ 212.51 Designation of roads, trails, and areas.

(a) *General.* Motor vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands shall be designated by vehicle class and, if appropriate, by time of year by the responsible official on administrative units or Ranger Districts of the National Forest System, provided that the following vehicles and uses are exempted from these designations:

(1) Aircraft;

(2) Watercraft;

(3) Over-snow vehicles (see § 212.81);

(4) Limited administrative use by the Forest Service;

(5) Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes;

(6) Authorized use of any combat or combat support vehicle for national defense purposes;

(7) Law enforcement response to violations of law, including pursuit; and

(8) Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations.

(b) *Motor vehicle use for dispersed camping or big game retrieval.* In designating routes, the responsible official may include in the designation the limited use of motor vehicles within a specified distance of certain designated routes, and if appropriate within specified time periods, solely for the purposes of dispersed camping or retrieval of a downed big game animal by an individual who has legally taken that animal.

§ 212.52 Public involvement.

(a) *General.* The public shall be allowed to participate in the designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands and revising those designations pursuant to this subpart. Advance notice shall be given to allow for public comment, consistent with agency procedures under the National Environmental Policy Act, on proposed designations and revisions. Public notice with no further public involvement is sufficient if a National Forest or Ranger District has made previous administrative decisions, under other authorities and including public involvement, which restrict motor vehicle use over the entire National Forest or Ranger District to designated routes and areas, and no change is proposed to these previous decisions and designations.

(b) *Absence of public involvement in temporary, emergency closures.* (1) *General.* Nothing in this section shall alter or limit the authority to implement temporary, emergency closures pursuant to 36 CFR part 261, subpart B, without advance public notice to provide short-term resource protection or to protect public health and safety.

(2) *Temporary, emergency closures based on a determination of considerable adverse effects.* If the responsible official determines that motor vehicle use on a National Forest System road or National Forest System trail or in an area on National Forest System lands is directly causing or will directly cause considerable adverse effects on public safety or soil, vegetation, wildlife, wildlife habitat, or cultural resources associated with that road, trail, or area, the responsible official shall immediately close that road, trail, or area to motor vehicle use until the official determines that such adverse effects have been mitigated or eliminated and that measures have been implemented to prevent future recurrence. The responsible official shall provide public notice of the closure pursuant to 36 CFR 261.51, including reasons for the closure and the estimated duration of the closure, as soon as practicable following the closure.

§ 212.53 Coordination with Federal, State, county, and other local governmental entities and tribal governments.

The responsible official shall coordinate with appropriate Federal, State, county, and other local governmental entities and tribal governments when designating National Forest System roads, National **Forest System trails, and areas on National Forest System lands pursuant to this subpart.**

§ 212.54 Revision of designations.

Designations of National Forest System roads, National Forest System trails, and areas on National Forest System lands pursuant to § 212.51 may be revised as needed to meet changing conditions. Revisions of designations shall be made in accordance with the requirements for public involvement in § 212.52, the requirements for coordination with governmental entities in § 212.53, and the criteria in § 212.55, and shall be reflected on a motor vehicle use map pursuant to § 212.56.

§ 212.55 Criteria for designation of roads, trails, and areas.

(a) *General criteria for designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands.* In designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use, the responsible official shall consider effects on National Forest System natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration.

(b) *Specific criteria for designation of trails and areas.* In addition to the criteria in paragraph (a) of this section, in designating National Forest System trails and areas on National Forest System lands, the responsible official shall consider effects on the following, with the objective of minimizing:

(1) Damage to soil, watershed, vegetation, and other forest resources;

(2) Harassment of wildlife and significant disruption of wildlife habitats;

(3) Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands; and

(4) Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands. In addition, the responsible official shall consider:

(5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

(c) *Specific criteria for designation of roads.* In addition to the criteria in paragraph (a) of this section, in designating National Forest System roads, the responsible official shall consider:

(1) Speed, volume, composition, and distribution of traffic on roads; and

(2) Compatibility of vehicle class with road geometry and road surfacing.

(d) *Rights of access.* In making designations pursuant to this subpart, the responsible official shall recognize:

(1) Valid existing rights; and

(2) The rights of use of National Forest System roads and National Forest System trails under § 212.6(b).

(e) *Wilderness areas and primitive areas.* National Forest System roads, National Forest System trails, and areas on National Forest System lands in wilderness areas or primitive areas shall not be designated for motor vehicle use pursuant to this section, unless, in the case of wilderness areas, motor vehicle use is authorized by the applicable enabling legislation for those areas.

§ 212.56 Identification of designated roads, trails, and areas.

Designated roads, trails, and areas shall be identified on a motor vehicle use map. Motor vehicle use maps shall be made available to the public at the headquarters of corresponding administrative units and Ranger Districts of the National Forest System and, as soon as practicable, on the website of corresponding administrative units and Ranger Districts. The motor vehicle use maps shall specify the classes of vehicles and, if appropriate, the times of year for which use is designated.

§ 212.57 Monitoring of effects of motor vehicle use on designated roads and trails and in designated areas.

For each administrative unit of the National Forest System, the responsible official shall monitor the effects of motor vehicle use on designated roads and trails and in designated areas under the jurisdiction of that responsible official, consistent with the applicable land management plan, as appropriate and feasible.

▪10. Add a new subpart C to read as follows:

Subpart C—Use by Over-Snow Vehicles

Sec.
212.80 Purpose, scope, and definitions.
212.81 Use by over-snow vehicles.

Authority: 7 U.S.C. 1011(f), 16 U.S.C. 551, E.O. 11644, 11989 (42 FR 26959).

§ 212.80 Purpose, scope, and definitions.

The purpose of this subpart is to provide for regulation of use by oversnow vehicles on National Forest System roads and National Forest System trails and in areas on National Forest System lands. For definitions of terms used in this subpart, refer to § 212.1 in subpart A of this part.

§ 212.81 Use by over-snow vehicles.

(a) *General.* Use by over-snow vehicles on National Forest System roads and National Forest System trails and in areas on National Forest System lands may be allowed, restricted, or prohibited.

(b) *Exemptions from restrictions and prohibitions.* The following uses are exempted from restrictions and prohibitions on use by over-snow vehicles:

(1) Limited administrative use by the Forest Service;

(2) Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes;

(3) Authorized use of any combat or combat support vehicle for national defense purposes;

(4) Law enforcement response to violations of law, including pursuit; and

(5) Use by over-snow vehicles that is specifically authorized under a written authorization issued under Federal law or regulations.

(c) *Establishment of restrictions and prohibitions.* If the responsible official proposes restrictions or prohibitions on use by over-snow vehicles under this subpart, the requirements governing designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands in §§ 212.52, 212.53, 212.54, 212.55, 212.56, and 212.57 shall apply to establishment of those restrictions or prohibitions. In establishing restrictions or prohibitions on use by over-snow vehicles, the responsible official shall recognize the provisions concerning rights of access in sections 811(b) and 1110(a) of the Alaska National Interest Lands Conservation Act (16 U.S.C. 3121(b) and 3170(a), respectively).

PART 251—LAND USES

Subpart B—Special Uses

▪11. Revise the authority citation for part 251, subpart B, to read as follows:

Authority: 7 U.S.C. 1011(f); 16 U.S.C. 460l– 6a, 460l–6d, 472, 497b, 497c, 551, 580d, 1134, 3210; 30 U.S.C. 185; 43 U.S.C. 1740, 1761–1771.

▪12. Amend § 251.51 by revising the definitions for ‘‘forest road or trail’’ and ‘‘National Forest System road’’ to read as follows:

§ 251.51 Definitions.

Forest road or trail. A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

National Forest System road. A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

PART 261—PROHIBITIONS

▪13. The authority citation for part 261 continues to read as follows:

Authority: 7 U.S.C. 1011(f); 16 U.S.C. 460l– 6d, 472, 551, 620(f), 1133(c)–(d)(1), 1246(i).

▪14. Amend § 261.2 to revise the definitions for ‘‘motor vehicle,’’ ‘‘forest road or trail,’’ ‘‘National Forest System road,’’ and ‘‘National Forest System trail,’’ and add definitions in alphabetical order for ‘‘administrative unit’’ and ‘‘area,’’ to read as follows:

Subpart A—General Prohibitions

§ 261.2 Definitions.

Administrative unit. A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land Between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System.

Area. A discrete, specifically delineated space that is smaller, and in most cases much smaller, than a Ranger District.

Forest road or trail. A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Motor vehicle means any vehicle which is self-propelled, other than:

(1) A vehicle operated on rails; and

(2) Any wheelchair or mobility device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area.

National Forest System road. A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

National Forest System trail. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

§§ 261.13 through 261.21 [Redesignated as §§ 261.15 through 261.23]

▪15. Redesignate §§ 261.13 through 261.21 as §§ 261.15 through 261.23.

▪15a. Add new § 261.13 and § 261.14 to read as follows:

§ 261.13 Motor vehicle use.

After National Forest System roads, National Forest System trails, and areas on National Forest System lands have been designated pursuant to 36 CFR 212.51 on an administrative unit or a Ranger District of the National Forest System, and these designations have been identified on a motor vehicle use map, it is prohibited to possess or operate a motor vehicle on National Forest System lands in that administrative unit or Ranger District other than in accordance with those designations, provided that the following vehicles and uses are exempted from this prohibition:

(a) Aircraft;

(b) Watercraft;

(c) Over-snow vehicles;

(d) Limited administrative use by the Forest Service;

(e) Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes;

(f) Authorized use of any combat or combat support vehicle for national defense purposes;

(g) Law enforcement response to violations of law, including pursuit;

(h) Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations; and

(i) Use of a road or trail that is authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

§ 261.14 Use by over-snow vehicles.

It is prohibited to possess or operate an over-snow vehicle on National Forest System lands in violation of a restriction or prohibition established pursuant to 36 CFR part 212, subpart C, provided that the following uses are exempted from this section:

(a) Limited administrative use by the Forest Service;

(b) Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes;

(c) Authorized use of any combat or combat support vehicle for national defense purposes;

(d) Law enforcement response to violations of law, including pursuit;

(e) Use by over-snow vehicles that is specifically authorized under a written authorization issued under Federal law or regulations; and

(f) Use of a road or trail that is authorized by a legally documented right-of-way held by a State, county, or other local public road authority.

▪16. Amend § 261.55 by revising the introductory text to read as follows:

§ 261.55 National Forest System trails.

When provided by an order issued in accordance with § 261.50 of this subpart, the following are prohibited on a National Forest System trail:

PART 295—USE OF MOTOR VEHICLES OFF NATIONAL FOREST SYSTEM ROADS [REMOVED]

▪17. Remove the entire part 295.

[*Note:* Copied and reformatted from: 68288 Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / Rules and Regulations]

Appendix B: Design Criteria Common to All Alternatives

Resources and their corresponding design criteria are listed below. Effects analysis was conducted presuming the implementation of these design criteria.

Botanical Resources Damage Protection

Design criteria must be developed for the following routes to avoid damage to R2 sensitive plant species, Forest plant species of local concern, M.A. 3.1 Botanical Areas, and riparian/wetland/fen areas.

Table B-1. Routes requiring design criteria

Species	Occurrence	Route Number	Alt B	Alt C	Alt D
Routes to be designed, removed, or rerouted to avoid impacts to R2 sensitive species					
Bearlodge RD					
Botrychium campestre	BOCA5-8	872.3		X	
Botrychium lineare	BOLI7-1	864.1 (outside Dugout Gulch Botanical Area)	X	X	
Carex alopecoidea	CAAL8-12	U71002	X		
	CAAL8-31	841.1L	X	X	
Cypripedium parviflorum	CYPA19-10	863.2C	X	X	
Viburnum opulus var. *americanum*	VIOPA2-2, VIOPA2-16	864.1 (in Dugout Gulch Botanical Area)	X	X	
	03DUG3A, 94S460B	U650017	X	X	
Northern Hills RD					
Carex alopecoidea	CAAL8-22	U710024		X	
Cypripedium parviflorum	950070B	U080045	X	X	X
Platanthera orbiculata	01G040	CZ0418, U010076	X	X	
	PLOR4-18	U010071	X	X	
Sanguinaria canadensis	SACA13-2	567.1F	X	X	X
	SACA13-2	172.1A	X	X	X
Viburnum opulus var. *americanum*	VIOPA2-4	U080156	X	X	
	980010	CZ4846	X	X	
Mystic RD					
Cypripedium parviflorum	CYPA19-2	CZ1790	X	X	X
Routes requiring design criteria to avoid impacts to Black Hills NF plant SOLC					
Mystic RD					
Gentiana affinis	07M008A	CZ4927		X	
Hell Canyon RD					
Gentiana affinis	GEAF-4	HC9	X	X	
	07B040A	CZ3526	X	X	
	07B042	HC1	X	X	
Routes requiring design criteria to avoid impacts to M.A. 3.1 Botanical Areas					
Bearlodge RD					
Dugout Gulch Botanical Area		864.1C	X	X	
		864.1	X	X	
		864.1A	X		
Routes requiring design criteria to avoid impacts to fens					
Mystic RD					
South Fork Castle Creek fen		385.1A	X	X	X
Newton Fork fen		304.1L	X	X	X

Cultural Resources

Design Criteria for Cultural Resources are based on established cultural resource protection protocols, and guidance provided in the *USDA FS Policy for NHPA Compliance in Travel Management: Designated Routes for Motor Vehicle Use* prepared by the FS in consultation with the Advisory Council on Historic Preservation. According to this policy, only certain travel management proposals are to be considered as undertakings with the potential to affect historic properties. Accordingly, only properties located in the area of potential effects for the following types of proposals require design criteria.

1. The construction of a new road or trail.
2. The authorization of motor vehicle use on a route currently closed to vehicles.
3. The formal recognition of a user-developed (unauthorized) route as a designated route open to motor vehicles.
4. Closing a route currently open to motorized use. (For this decision no proposed road closures would be implemented on the ground. Any road proposed for closure would not be designated as open to motorized travel on the map. There would be no ground disturbance and therefore no potential to effect historic properties. If physical closures such as gates or berms are proposed in the future, the districts would determine how the road would be closed and consultation would be handled with a separate 106 report.)
5. The area of potential effects not only includes the route corridor itself, but also the area adjacent to the route designated for motorized dispersed camping and motorized game retrieval.

Unless otherwise recommended by cultural resources specialists in consultation with affected State Historic Preservation Offices (SHPOs) and Tribes, the following Design Criteria apply to all sites within the area of potential effect as defined in items 1-5 above:

- Geotextile fabric and a layer of crushed rock will be applied to all routes described in items 1-4 above where there is the potential to disturb cultural properties.
- All cultural properties located on 10 percent slopes or less within designated dispersed motorized camping areas will be monitored annually for a period of 3 years after the decision is implemented.
- All cultural properties located on 30 percent slopes or less within designated motorized game retrieval areas will be monitored annually for a period of 3 years after the decision is implemented.
- Sites determined to be threatened or adversely impacted by dispersed motorized camping or dispersed motorized game retrieval may require additional site protection measures. These site protection measures may include modifying routes to avoid the resources, increasing monitoring or law enforcement, area closures, constructing barriers, concealing sites, various forms of surface hardening treatments, and interpreting resources.

Existing, formally established system (classified) roads and trails including up to a 300-foot game retrieval and dispersed camping corridor, already open to motor vehicle travel, generally need not be re-evaluated for purposes of this rule. Their designation on a MVUM would not generally be considered an undertaking for the purposes of NHPA and not subject to Section 106 review.

If, during the course of any ground disturbance related to this project, any bones, artifacts, foundations, or other indications of past human occupation of the area were discovered, work would stop and a Forest or District archaeologist would be contacted. The archaeologist would determine if additional consultation with the SHPO and applicable Native American Tribes would be required before work continued.

Hydrology and Fisheries

Road/Trail Drainage within the Water Influence Zone (WIZ)

- Provide adequate road and trail cross drainage to reduce erosion (Guideline 9202e) by installing waterbars/rolling dips within the WIZ using the following as a guide:

Spacing for Water Bars	
Road or Trail Grade (%)	Spacing Between Waterbars (Feet)
2	250
5	135
10	80
15	60
20	45
Source: SD State University et al. (2003)	

- One waterbar/rolling dip should be installed as close to the stream crossing as possible (on both sides) to redirect concentrated water off the trail and allow for filtration of concentrated water before entering the stream to disconnect the pollutant sources (sediment).
- The waterbars/rolling dips just before the stream crossing should be hardened with gravel to maintain function.
- If there is no opportunity to drain waterbars/rolling dips, small sediment basins should be used to maintain the above water bar/rolling dip spacing.

Stream Crossings

- Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life (Standard 1203). (No native material crossings, gravel or large gravel rocks should be used because these do not protect the stream bottom and banks. They allow sediment to be generated during the crossing of each vehicle.)
    - Perennial stream crossings on the following routes should be armored or remediated as soon as practicable in this order of priority, if designated on the MVUM. Prioritization is based on level of use, degree of impact, and aquatic resource value.

Route	Stream Crossing	Alt B	Alt C	Alt D	District
CZ-4895	Rapid Creek		x		Mystic
CZ-3050	South Fork Castle Creek	x	x	x	Mystic
CZ-3462	Heely Creek	x	x	x	Mystic
CZ-3464	Heely Creek	x	x	x	Mystic
CZ-0886	Heely Creek	x	x		Mystic
MY84	Heely Creek	x	x	x	Mystic
U230014	Tributary – Ditch Creek	x	x	x	Mystic
CZ-4927	Castle Creek		x		Mystic
U120146	Gimlet Creek	x	x		Northern Hills
CZ-4846	Gimlet Creek	x	x		Northern Hills
MY3	Gimlet Creek	x	x	x	Northern Hills
MY66	Spring Creek	x			Mystic
MY50	Horse Creek	x			Mystic

- Design options for mitigation. (The goal is to protect the stream bottom and banks to prevent sediment from entering the stream or being mobilized when vehicles cross and to prevent widening of the stream.)

  - Bridge
  - Cattle guard (bridge)
  - Arch/half round culvert (width is at least bankfull width)
  - Concrete rails/mats (buried so top of rails/mats is at the stream bed elevation)
  - Culvert (diameter or width is at least bankfull width and buried so stream substrate is in the bottom of the culvert)
  - Other material may be used as it becomes available as long as it meets the goal to prevent sediment and stream widening
- Generally, the road/trail grade to the crossing will be less than 5 percent.
- Minimize fill in floodplains to facilitate crossings to allow flood flows to pass with minimal interruption.
- Perennial stream crossings on the following routes should be monitored annually for the first 3 years if designated on the MVUM to determine if unacceptable resource damage is occurring to streambanks and riparian vegetation. If so, the streambanks should be mitigated at a designated crossing location per the options identified above.

Route	Stream Crossing	Alt B	Alt C	Alt D	District
CZ-4829	Elk Creek	x	x		Northern Hills
CZ-4859	Jim Creek	x	x		Northern Hills
CZ-4878	Prairie Creek		x		Mystic
CZ-4889	Tributary – Spring Crk		x		Mystic
CZ-4889	Victoria Creek	x	x	x	Mystic
CZ-4895	Prairie Creek		x		Mystic
CZ-4910	Estes Creek	x	x		Northern Hills
CZ-4927	Slate Creek		x		Mystic
CZ-4928	Newton Fork Creek		x		Mystic
U270093	Tepee Gulch	x	x		Mystic

Closing Roads

- When possible and circumstances permit, road/stream crossings on perennial and intermittent streams on closed roads will have the crossing rehabilitated by restoring the natural shape **(including stream width)** to allow natural flows at all stages by pulling culverts and by removing any fill placed in the floodplain.

Fish Spawning Protection

- The following design criteria should apply for instream construction activities to install, repair or remove road/trail crossings on perennial streams to meet the R2 Watershed Conservation Practices Management Measure 3; Design Criteria (c) to keep heavy equipment out of streams during fish spawning, incubation, and emergence periods.
  - In all South Dakota streams classified as cold water streams, when water flow is present, the discharge of dredged or fill material shall not take place between October 15 and April 1.
  - In Wyoming, the period and timing of in-water construction should be adjusted as necessary to avoid conflicts with brown or brook trout spawning from September 15 through November 30.

Wet Areas/Wetland Areas

- Areas not connected to streams that are wet and have riparian/wetland vegetation will be avoided and runoff from the roads/trail will not be drained into these areas.
- Avoid creating elevated road/trails through wetlands which disrupt the flow of water through the wetland.

Trailheads

- Do not locate or expand trailheads in the WIZ (a minimum 100 feet buffer from waterbodies).

Game Retrieval and Road Egress

- Prohibit land vehicles from entering perennial streams where resource damage would occur except to cross at specified points (Guideline 9107).
- Vehicular traffic, except for snowmobiles, will be restricted to roads and trails in riparian areas (Guideline 9108).
- Walk-in fisheries are closed to motorized travel (Guideline 9109).

Dispersed Camping

- Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain (Guideline 5301).

Lands

Prior to implementing any of these alternatives, a study should be conducted to analyze the following effects of limiting access to public lands: (1) effects of reduced access to private land (across public land) and how this would increase the need for special use permits, (2) effects of reduced access to private land and its potential impact on adjoining property values by restricting development and possibly changing the use of adjoining private land from recreational to residential, and (3) effects of reduced access on small businesses such as campgrounds which rely on motorized access to public land as one of their forms of recreation.

An implementation schedule for any of these alternatives should be established, utilizing a phased-in approach. The implementation schedule should be initiated in one or two of the most problematic areas, allowing the Forest to assess the impacts to public and private programs and entities that may be affected. The assessments could then be utilized to plan further implementation of travel management alternatives.

Language in the Travel Management Plan should clearly identify the rights of access for all motorized activities including administrative use.

Minerals

The Travel Management Plan should contain language that clearly states the rights of the public to access Forest lands for prospecting and mining. The Travel Management Plan should clearly inform FS decision makers that travel management regulations and the MVUM cannot unreasonably restrict the rights of prospectors and miners. The following statements must be included in the Travel Management Plan:

- Prospectors and miners have a statutory right, not mere privilege, under the mining laws to go upon and use the open public domain lands of the NFS for the purposes of mineral exploration, development and production. Exercise of that right may not be unreasonably restricted (39 *Federal Register*, 31317).

- The right of reasonable access for purposes of prospecting, locating, and mining is provided by statute. Such access must be in accordance with the rules and regulations of the FS. However, the rules and regulations may not be applied so as to prevent lawful mineral activities or to cause undue hardship on bona fide prospectors and miners (Forest Service Manual 2800, Section 2813.4)

Range and Weeds

- Any road closures that install impassable physical barriers, such as large rocks or earthen berms that could restrict administrative access, should be done on a site-specific basis with interdisciplinary input.
- Any new road or trail that crosses a fence would have gates or cattle guards installed (consider self-closing gates on trails).

Wildlife

- The Powerline Trailhead (Alternatives B, C, and D) would be closed seasonally or otherwise designed with barricades placed at the proposed trailhead or otherwise designed to continue to limit parking to one or two vehicles with trailers, before being added to the MVUM, to be consistent with Forest Plan Standard 3111.
- The following routes or a portion of these routes would be closed seasonally from April 1 to August 15 to protect nesting goshawks, for the alternatives indicated.

Table B-2. Routes closed seasonally (April 1–August 15) to protect nesting goshawks

Route Number	Alternative B	Alternative C	Alternative D
Bearlodge RD			
832.1		X	
830.3		X	
830.1B	X		
U680017	X		
U680015	X	X	
U680078		X	
863.3G		X	
U720011		X	
805.3O		X	
875.2B		X	
875.2A		X	
875.2F		X	
806.2A	X	X	
875.1C	X	X	
875.1A	X	X	
U710120	X	X	
875.2D		X	
875.2F		X	
806.2E	X	X	
806.2F		X	
806.2B		X	
806.2G		X	

Route Number	Alternative B	Alternative C	Alternative D
Northern Hills RD			
733.3E	X	X	
733.3D	X	X	
733.3A	X	X	
733.3C	X	X	
CZ-3569	X		
U120121	X	X	
U120124	X	X	
U120148	X	X	
U130161	X	X	
Mystic RD			
CZ-4887		X	
159.1B	X	X	X
159.1C	X	X	X
CZ-4878		X	
389.1K	X	X	
423	X	X	X
304.1H	X	X	X
304.1F	X	X	X

Appendix C: Literature Cited

Anderson, T. 2003. Conservation assessment for the woodpeckers in the Black Hills National Forest South Dakota and Wyoming. USDA Forest Service, Custer, SD. http://www.fs.fed.us/Region2/blackhills/projects/planning/assessments/woodpeckers.pdf. [July 13, 2004].

Anderson, T. 2004. Field guide to Black Hills land snails. Natural History Inventory Publication Number 22. University of Colorado Museum, Boulder. 32p.

Anderson, T. 2005. *Oreohelix strigosa cooperi* (Cooper's Rocky Mountain Snail): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/coopersrockymountainsnail.pdf [April 14, 2008].

Anderson, T., R. Guralnick, and K. Weaver. 2006. Endemism and population relationships of the Black Hills Oreohelix snails. Final report. February.

Arcese, P., M.K. Sogge, A,B. Marr, and M.A. Patten. 2002. Song sparrow (*Melospiza melodia*). *In:* The Birds of North America, No. 704. A. Poole and F. Gill, eds. The Birds of North America, Inc. Philadelphia, PA.

Bartlett, R.D. and A. Tennant. 2000. Snakes of North America, Western Region. Gulf Publishing, Houston, TX.

Bureau of Economic Analysis (BEA). 2008. U.S. Department of Commerce. Available: http://www.bea.gov/newsreleases/regional/spi/2008/pdf/spi0308.pdf

Beason, J., K. Hutton, A. Panjabi, R. Sparks, and D. Hanni. 2006. Monitoring the birds of the Black Hills: 2005 field season report. Technical Report M-MBBH05-01. Rocky Mountain Bird Observatory, Brighton, CO. 113p. Available: http://www.fs.fed.us/r2/blackhills/projects/wildlife/index.shtml.

Belcher, J.W. and S.D. Wilson. 1989. Leafy spurge and species composition of a mixed-grass prairie. Journal of Range Management 42: 172–175.

Belica, L.T. and N.P. Nibbelink. 2006. Mountain sucker (*Catostomus platyrhynchus*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/mountainsucker.pdf [July 9, 2008].

Beidleman, C.A. 2000. Partners in Flight, Land Bird Conservation Plan, Colorado. Version 1.0. Colorado Partners in Flight, Estes Park, CO. Available: http://www.blm.gov/wildlife/plan/pl-co-10.pdf.

Best, K.F., G.G. Bowes, A.G. Thomas, and M.G. Shaw. 1980. The biology of Canadian weeds. 39. *Euphorbia esula* L. Canadian Journal of Plant Science 60: 651–663.

Benzon, T.A. and R. Halseth. 1999. Reintroduction of Rocky Mountain bighorn sheep in the Black Hills, South Dakota, 1986–1994. Completion Report No. 99-12. South Dakota Department of Game, Fish and Parks. Pierre, SD. July.

Blair, T. (*chairman*), [and others]. 2006. Black Hills National Forest Advisory Board travel management subcommittee report. Black Hills National Forest Advisory Board. June. Available: http://www.fs.fed.us/r2/blackhills/recreation/travel_management/nfab_tmsc_report_06082006.pdf

Blakesley, J.A., G. Giroir, and C. White. 2008. Population densities and trend detection of avian species on the Black Hills National Forest. Technical Report M-MBBH07-02. Rocky Mountain Bird Observatory, Brighton, CO. 45p.

Bonnot, T. 2004. Association of black-backed woodpeckers with mountain pine beetle infestation in the Black Hills, South Dakota. Interim Progress Report. USDA Forest Service, Rocky Mountain Research Station and University of Missouri-Columbia. December. 8p.

Bowles, A.E. 1995. Responses of wildlife to noise. *In:* Wildlife and recreationists: Coexistence through management and research. (R.L. Knight and K.J. Gutzwiller, *editors*.) Island Press, Washington, D.C. pp. 109–156.

Buskirk, S.W. and L.F. Ruggiero. 1994. American marten. *In:* The scientific basis for conserving forest carnivores in the western United States. (L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *editors*.) General Technical Report RM-254, USDA Forest Service, Rocky Mountain Range and Experiment Station.

Buskirk, S.W. and R.A. Powell. 1994. Habitat ecology of fishers and American martens. *In:* Martens, sables, and fishers: Biology and Conservation. (S.W. Buskirk, A.S. Harestad, M.G. Raphael, *compilers and editors*.) Cornell University Press, Ithaca, NY. pp. 283–296.

Buskirk. 2002. Conservation assessment for the American marten in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Custer, SD.

Carter, J.M., D.G. Driscoll, J.E. Williamson and V.A. Lindquist. 2002. Atlas of water resources in the Black Hills area, South Dakota. USGS. Available: http://water.usgs.gov/pubs/ha/ha747/index.html [July 9, 2008].

Clark, T.W. and M.R. Stromberg. 1987. Mammals in Wyoming. Museum of Natural History, University of Kansas, Lawrence, KS. 314p.

Collins, C.P. and T.D. Reynolds. 2005. Ferruginous hawk (*Buteo regalis*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/ferruginoushawk.pdf. [April 15, 2008].

Cordell, H., C.J. Betz, G. Green, and M. Owens. 2005. (*See USDA FS 2005c*)

Cordell, H., C. Betz, G. Green, and B. Stephens. 2008. Off-highway vehicle recreation in the United States and its Regions and States: A national report from the National Survey on Recreation and the Environment (NSRE). Available: http://www.fs.fed.us/recreation/programs/ohv/IrisRec1rpt.pdf

Cryan, P., M. Bogan, and G. Yanega. 2001. Roosting habits of four bat species in the Black Hills of South Dakota. Acta Chiropterologica 3: 43–52.

DePerno, C.S., J.A. Jenks, S.L. Griffin, L.A. Rice, and K.F. Higgins. 2002. White-tailed deer habitats in the central Black Hills. Journal of Range Management 55: 242–252.

Dinsmore, S.J. 2003. Mountain plover (*Charadruis montanus*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/mountainplover.pdf. [July 29, 2008].

Dixon, R.D., and V.A. Saab. 2000. Black-backed woodpecker (*Picoides arcticus*). *In:* The birds of North America. (A. Poole and F. Gill, *editors*.) No. 509. The Academy of Natural Sciences, Philadelphia, PA., and The American Ornithologists' Union, Washington, D.C.

English, D.B.K., S.M. Kocis, and D.P. Hales. 2004. Off-highway vehicle use on national forests: Volume and characteristics of visitors. Special report to the National Implementation Team. USDA Forest Service, Southern Research Station.

Fecske, D.M., J.A. Jenks, and V.J. Smith. 2002. Field evaluation of a habitat-relation model for the American marten. Wildlife Society Bulletin 30: 775–782.

Fecske, D.M., J.A. Jenks, C. Kopplin, and T.L. Serfass. 2003. A landscape analysis for American martens (*Martes americana*) in the Black Hills, South Dakota. Draft publication dated October 10, 2003.

Federal Register. 2005. 36 CFR Part 212, 251, and 295. Final rule: travel management; designated routes and areas for motor vehicle use. National Archives and Records Administration. Available: http://www.fs.fed.us/recreation/programs/ohv/final.pdf. [July 9, 2008]. \

Federal Emergency Management Administration (FEMA). 2008a. Executive Order 11988: floodplain management. FEMA. Available: http://www.fema.gov/plan/ehp/ehplaws/eo11988.shtm. [July 9, 2008].

FEMA. 2008b. Executive Order 11990, protection of wetlands, 1977. FEMA. Available: http://www.fema.gov/plan/prevent/floodplain/eo_11990.shtm. [July 9, 2008].

Forrest, S.C., T.W. Clark, L. Richardson, and T.M. Campbell, III. 1985. Black footed-ferret habitat: Some management and reintroduction considerations. Technical Bulletin No. 2, Wyoming Bureau of Land Management, Wildlife.

Foulke, T., R. Coupal, and D. Taylor. 2002. Economic trends in Wyoming's travel and tourism sector. B-1131. Cooperative Extension Service. University of Wyoming. Available: http://ces.uwyo.edu/pubs/B1131.pdf

Foulke, T., D. Olson, D. Taylor, C. Bastian, and R. Coupal. 2006. A survey and economic assessment of off-road vehicle use in Wyoming. Wyoming Department of State Parks and Cultural Resources, Division of State Parks and Historic Sites, State Trails Program. Available: http://wyotrails.state.wy.us/Research/ORVStudy2006.pdf

Frest, T.J. and E.J. Johannes. 2002. Land snail survey of the Black Hills National Forest, South Dakota and Wyoming. Summary report, 1991–2001. Final Report Contract # 43-67TO-8-1085. USDA Forest Service, Black Hills National Forest.

Frenkell, R.E. 1970. Ruderal vegetation along some California roadsides. University of California Press, Berkeley.

Frison, G.C. 1991. Prehistoric hunters of the High Plains. Academic Press, New York.

Gelbard, J.L., and S. Harrison. 2003. Roadless habitats as refuges for native grasslands: Interaction with soil, aspect, and grazing. Ecological Applications 13(2): 404–415.

Giroir, G., C. White, R. Sparks. 2007. Monitoring the birds of the Black Hills: 2007 field season report. Technical Report M-MBBH07-01. Rocky Mountain Bird Observatory, Brighton, CO. 81p. Available: http://www.fs.fed.us/r2/blackhills/projects/wildlife/index.shtml. [July 29, 2008].

Graul, W.D. 1975. Breeding biology of the mountain plover. Wilson Bulletin 87: 6–31.

Greater Yellowstone Coalition. 2006. Publication on the science of healthy rivers. Available: http://www.greateryellowstone.org/ecosystem/waters/pubs.html. [July 9, 2008].

Greenberg, C.H., S.H. Crownover, and D.R. Gordon. 1997. Roadside soil: A corridor for invasion of xeric scrub by nonindigenous plants. Natural Areas Journal 17: 99–109.

Griffin, S.L., L.A. Rice, C.S. DePerno, and J.A. Jenks. 1999. Seasonal movements and home ranges of white-tailed deer in the central Black Hills, South Dakota and Wyoming, 1993–1997. Completion report no. 99-03. South Dakota Department of Game, Fish and Parks, Pierre, SD. 61p.

Gucinski, H., M.J. Furniss, R.R. Ziemer, M.H. Brookes. 2001. Forest roads: A synthesis of scientific information. General Technical Report PNWGTR-509, USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Available: http://www.fs.fed.us/pnw/pubs/pnw_gtr509.pdf. [July 9, 2008].

Hall, J., H.J. Marriott, and J.K. Perot. 2002. Ecoregional conservation in the Black Hills. The Nature Conservancy, Midwest Conservation Science Center, Midwestern Resource Office, Minneapolis, MN.

Hansen, C., J. Millspaugh, and M.A. Rumble. 2008. Factors affecting the probability of detecting ruffed grouse in the Black Hills National Forest. Progress Report 1, January 14.

Hayward, G.D. and R.E. Escano. 1989. Goshawk nest-site characteristics in western Montana and northern Idaho. Condor 91: 476–479.

Hayward, G.D. and J. Verner, *technical editors*. 1994. Flammulated, boreal, and great gray owls in the United States: A technical conservations assessment. General Technical Report. RM-253, USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Higgins, K.E., E. D. Stukel, J.M. Goulet, and D.C. Backlund. 2000. Wild mammals of South Dakota. South Dakota Department of Game, Fish and Parks. Pierre, SD.

Hornbeck, J.H.; C. H. Sieg; D. Reyher; and D.J. Bacon. 2003. Conservation assessment for the large round-leaved orchid (*Platanthera orbiculata*) in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service. Custer, South Dakota.

Hutton, K., J. Beason, G. Giroir, R. Sparks, and D. Hanni. 2007. Monitoring the birds of the Black Hills: 2006 field season report. Technical Report M-MBBH06-01. Rocky Mountain Bird Observatory, Brighton, CO. 71p. Available: http://www.fs.fed.us/r2/blackhills/projects/wildlife/index.shtml. [July 29, 2008].

Huxoll, C. 2007. 2006 annual report: Big game harvest projections. South Dakota Game Report N0. 2007-03, South Dakota Department of Game, Fish and Parks, Pierre, SD. 74p.

Isaak, D.J., W.A. Hubert, C.R. Berry, Jr. 2003. Conservation assessment for lake chub, mountain sucker and finescale dace in the Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region, Custer, SD. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/chub_sucker_dace.pdf. [July 9, 2008].

Jensen, P.K. 1995. Effect of light environment during soil disturbance on germination and emergence pattern of weeds. Annals of Applied Biology 127: 561–571.

Johnsgard, P.A. 1988. North American owls, biology and natural history. Smithsonian Institution Press, Washington, D.C. and London.

Johnsgard, P.A. 1990. Hawks, eagles, and falcons of North America: Biology and natural history. Smithsonian Institution Press, Washington, D.C.

Johnson, A.S. and S.H. Anderson. 2002. Conservation assessment for the Western burrowing owl (*Athene cunicularia hypugaea*) in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Custer, SD. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/burrowing_owl.pdf . [July 29, 2008].

Johnson, H.B., F.C. Vasek, and T. Yonkers. 1975. Productivity, diversity, and stability relationships in Mojave Desert roadside vegetation. Bulletin of the Torrey Botanical Club 102(3): 106–115.

Kocis, S.M., B.K. Donald, S.J. English, R.A. Zarnoch, L. Warren, and C. Ruka. (2004) Black Hills National Forest. *In:* National visitor use monitoring results. USDA Forest Service, Southern Research Station (Producer). Available: http://www.fs.fed.us/recreation/programs/nvum/reports/year4/R2_F3_blackhills_final.htm. [May 2005].

Kennedy. P.L. 2003. Northern goshawk (*Accipiter gentiles atricapillus*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: www.fs.fed.us/Region 2/projects/scp/assessments/northerngoshawk.pdf. [January 2, 2003].

Klute, D.S., L.W. Ayers, M.T. Green, W. H. Howe, S.L. Jones, J.A. Shaffer, S.R. Sheffield, and T.S. Zimmerman. 2003. Status assessment and conservation plan for the western burrowing owl in the United States. USDI Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

Leonard, D.L. 2001. Three-toed woodpecker (*Picoides tridactylus*). *In:* The birds of North America (A. Poole and F. Gill, *editors*) No. 588. The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Lonsdale, W.M. and A.M. Lane. 1994. Tourist vehicles as vectors of weed seeds in Kakadu National Park, northern Australia. Biological Conservation 69: 277–283.

Luce, B., A. Cerovski, B. Oakleaf, J. Priday, and L. Van Fleet. 1999. Atlas of birds, mammals, reptiles, and amphibians in Wyoming. Wyoming Game and Fish Department, Wildlife Division, Biological Services Section, Lander, WY. November.

Lui, W.. 2007. 10 year outlook, Wyoming economic and demographic forecast 2007 to 2016. Wyoming Department of Administration and Information, Economic Analysis Division, WY. Available: http://eadiv.state.wy.us

Marriott, H., D. Faber-Langendoen, A. McAdams, D. Stutzman, and B. Burkhart. 1999. The Black Hills community inventory – Final report. The Nature Conservancy, Midwest Conservation Science Center, Midwestern Resource Office, Minneapolis, MN.

Marriott, H. and D. Faber-Langendoen. 2000. Black Hills community inventory – Volume 2: Plant community descriptions. The Nature Conservancy, Midwest Conservation Science Center and Association for Biodiversity Information, Midwestern Resource Office, Minneapolis, MN.

McIntosh, A.C. 1931. A botanical survey of the Black Hills of South Dakota. Black Hills Engineer 12: 159–276.

Merwin, D.S. 2000. Comparing levels and factors of lambing mortality between two herds of Rocky Mountain bighorn sheep in the Black Hills, South Dakota. Masters Thesis, University of Washington, Seattle. 125p.

Mohren, S.R. 2002. Habitat evaluation and density estimates for the black-backed woodpecker (*Picoides arcticus*) and northern three-toed woodpecker (*Picoides tridactylus*) in the Black Hills National Forest. Masters Thesis, University of Wyoming. Laramie.

Moore, L., S. Friedley, and D.L. Hazlett. (2006, July 31). *Carex alopecoidea* Tuckerman (foxtail sedge): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/carexalopecoidea.pdf.

Nicholoff, S.H., (*compiler*). 2003. Wyoming bird conservation plan, Version 2.0. Wyoming Partners In Flight. Wyoming Game and Fish Department, Lander, WY. Available: http://www.blm.gov/wildlife/plan/WY/menu.htm. [July 14, 2004].

Olson, D.R. 2006. A graphic summary of South Dakota. Rural Life/Census Data Center. Department of Rural Sociology, South Dakota State University, SD. Available: http://sdrurallife.sdstate.edu/newcommunity/graphicsummary.pdf

Olson, R. and W.A. Hubert. 1994. Beaver: Water resources and riparian habitat manager. University of Wyoming. Laramie.

Ortega, Y.K. and D.E. Capen. 2002. Roads as edges: Effects on birds in forested landscapes. Forest Science 48(2): 381–390.

Ouren, D.S., C. Hass, C.P. Melcher, S.C. Stewart, P.D. Ponds, N.R. Sexton, L. Burris, T. Fancher, and Z.H. Bowen. 2007. Environmental effects of off-highway vehicles on Bureau of Land Management lands: A literature synthesis, annotated bibliographies, extensive bibliographies, and internet resources. Open File Report 2007-1353. U.S. Geological Survey. (Accessed at: http://www.fort.usgs.gov/Products/Publications/pub_abstract.asp?PubID=22021)

Oxley, D.J., M.B. Fenton, and G.R. Carmody. 1973. The effects of roads on populations of small mammals. Department of Biology, Carleton University, Ottawa, Canada. pp 51–58.

Panjabi, A. 2001. Monitoring the birds of the Black Hills: Year 1, final report. Rocky Mountain Bird Observatory, Fort Collins, CO.

Panjabi, A. 2003. Monitoring the birds of the Black Hills: Year 2, final report. Rocky Mountain Bird Observatory, Brighton, CO.

Panjabi, A. 2004. Monitoring birds of the Black Hills: Year 3, Annual report submitted to the Black Hills National Forest. Rocky Mountain Bird Observatory, Brighton, CO.

Panjabi, A. 2005. Monitoring the birds of the Black Hills: Year 4, Annual Report. Rocky Mountain Bird Observatory, Brighton, CO. Available: http://www.fs.fed.us/r2/blackhills/projects/wildlife/index.shtml. [July 29, 2008].

Parendes, L.A., and J.A. Jones. 2000. Role of light availability and dispersal in exotic plant invasion along roads and streams in the H.J. Andrews Experimental Forest, Oregon. Conservation Biology 14(1): 64–75.

Parrish, J.B., D.J. Herman and D.J. Reyher, and Black Hills National Forest. 1996. A century of change in the Black Hills forest and riparian ecosystems. USDA Forest Service Agricultural Experiment Station, South Dakota State University.

Peterson, R.A. 1995. The South Dakota breeding bird atlas. South Dakota Ornithologists' Union, Jamestown, ND. Northern Prairie Wildlife Research Center Home Page. Available: http://www.npwrc.usgs.gov/resource/distr/birds/sdatlas/sdatlas.htm (Version 06JUL2000).

Pierson, E. D., M.C. Wackenhut, J.S. Altenbach, P. Bradley, P. Call, D.L. Genter, C.E. Harris, B.L. Keller, B. Lengus, L. Lewis, B. Luce, K.W. Navo, J.M. Perkins, S. Smith, and L. Wilch. 1999. Species conservation assessment and strategy for Townsend's big-eared bat (*Corynorhinus townsendii townsendii* and *Corynorhinus townsendii pallescens*). Idaho Conservation Effort, Idaho Department of Fish and Game, Boise.

Rabe, M., T. Morrell, H. Green, J. Devos Jr., and C. Miller. 1998. Characteristics of ponderosa-pine snag roosts used by reproductive bats in northern Arizona. Journal of Wildlife Management 62(2): 612–621.

Reed, R.A., J. Johnson-Barnard, and W.L. Baker. 1996. Contributions of roads to forest fragmentation in the Rocky Mountains. Conservation Biology 10(4) 1098–1106.

Reynolds R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management recommendations for the northern goshawk in the southwestern United States. General Technical Report RM-217, USDA Rocky Mountain Forest and Range Experiment Station and Southwestern Region Forest Service.

Rom, L., T. Church and M. Church. 1996. Black Hills National Forest cultural resources overview. Paper on file at the Black Hills National Forest Supervisor's Office.

Rowland, M.M., M.J. Wisdom, B.K. Johnson. and M.A. Penninger. 2004. Effects of roads on elk: Implications for management in forested ecosystems. Transactions of the sixty-ninth North American Wildlife and Natural Resources Conference: Resource stewardship in the 21st century: A voyage of rediscovery: March 16–20, 2004, Spokane, WA. Wildlife Management Institute, Washington, D.C. pp. 491–508.

Royer, R.A., and G.M. Marrone. 1992. Conservation status of the regal fritillary (*Speyeria idalia*) in North and South Dakota. A report to the USDI Fish and Wildlife Service, Denver, CO.

Rumble, M.A. 2002. Evaluation of mountain pine beetle epidemics as habitat for cavity nesting birds. Preliminary findings for ISA 203-02-020. Report to the Black Hills National Forest from the Rocky Mountain Research Station, Rapid City, SD. September 23, 2002.

Rumble, M.A., and S.H. Anderson. 1996. Microhabitats of Merriam's turkeys in the Black Hills, South Dakota. Ecological Applications 6(1) 326–334.

SAIC. 2003. Memorandum. A framework for revising deer and elk strategic management direction on the Black Hills National Forest. Science Application International Corporation, SAIC project number 01-0209-04-4456-106.

Sandrini, J. 2007a. 2006 job completion report, Black Hills white-tailed deer. Casper Region; Herd Unit 706, Wyoming Game and Fish Department, Newcastle.

Sandrini, J. 2007b. 2006 job completion report, elk. Casper Region, Herd Unit 740, Wyoming Game and Fish Department, Newcastle.

Sandrini, J. 2007c. 2006 job completion report, mule deer. Casper Region, Herd Unit 751, Wyoming Game and Fish Department, Newcastle.

Sauer, J.R., J.E. Hines, and J. Fallon. 2001. The North American breeding bird survey results and analysis: 1966–2000, Version 2001.2. USGS Patuxent Wildlife Research Center, Laurel, MD.

Schmidt, W. 1989. Plant dispersal by motor cars. Plant Ecology 80: 147–152.

Schmidt, C.A. 2003a. Conservation assessment for the fringed bat in the Black Hills National Forest of South Dakota and Wyoming. USDA Forest Service, Black Hills National Forest, Custer, SD. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/fringed_bat.pdf. [July 29, 2008].

Schmidt, C.A. 2003b. Conservation assessment for the Townsend's big-eared bat in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Black Hills National Forest, Custer, SD. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/big_ear_bat.pdf. [July 29, 2008].

SD DENR. 2008. (*See South Dakota DENR. 2008*)

Sedgwick, J.A. 2006. Long-billed curlew (*Numenius americanus*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/longbilledcurlew.pdf [June 3, 2008].

Sharps, J.C. and D. O'Brien. 1985. Peregrine falcon reintroduction in the Black Hills, South Dakota, 1977–1980. Game Report, South Dakota Department of Game, Fish and Parks, Wildlife Division, Pierre, SD. Completion Report No. 85-10.

Sheley, R.L., and J.K. Petroff. 1999. Biology and management of noxious rangeland weeds. Oregon State University Press, Corvallis.

Sibley, D.S. 2000. The Sibley guide to birds. Alfred A. Knopf, New York.

Sieg, C.H., and K.E. Severson. 1996. Managing habitats for white-tailed deer: Black Hills and Bear Lodge Mountains of South Dakota and Wyoming. General Technical Report RM-GTR-274, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Slater, G.L. 2004. Grasshopper sparrow (*Ammodramus savannarum*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/grasshoppersparrow.pdf. [April 12, 2005].

Slater, G.L. and C. Rock. 2005. Northern harrier (*Circus cyaneus*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northernharrier.pdf [April 16, 2008].

Smith, B.E. 2003. Conservation assessment for the northern leopard frog in the Black Hills National Forest South Dakota and Wyoming. Black Hills National Forest, Custer, SD. Available: http://www.fs.fed.us/Region 2/blackhills/projects/planning/assessments/leopard_frog.pdf. [July 29, 2008].

Smith, B.E. and D.A. Keinath. 2007. Northern leopard frog (*Rana pipiens*): A technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northernleopardfrog.pdf [July 29, 2008].

Smith, B.E. and N.T. Stephens. 2003. Conservation assessment for the redbelly snake in the Black Hills National Forest South Dakota and Wyoming. Black Hills National Forest, Custer, SD.

South Dakota DENR. 2008. The 2008 South Dakota integrated report for surface water quality assessment. S.M. Pirner, secretary. Pierre, SD.

South Dakota Ornithologist's Union. 1991. The birds of South Dakota, second edition. The South Dakota Ornithologists' Union. Northern State University Press, Aberdeen, SD.

South Dakota State Historical Society. 2005. Guidelines for cultural resource surveys and survey reports in South Dakota (for review and compliance). Papers on file at the Black Hills National Forest Supervisor's Office.

Spaulding, S. and L. Elwell. 2007. Increase in nuisance blooms and geographic expansion of the freshwater diatom *Didymosphenia geminata*: Recommendations for response. [Online Serial]. Available: http://www.epa.gov/region8/water/didymosphenia/White%20Paper%20Jan%202007.pdf. [July 9, 2008].

Squires, J.R. and L.F. Ruggiero. 1996. Nest-site preference of northern soshawks in Southcentral Wyoming. Journal of Wildlife Management 60(1): 170–177.

Stewart, R.K. and C.A. Thilenius. 1964. Stream and lake inventory and classification in the Black Hills of South Dakota. Dingell-Johnson Project F-1-R-13, Job Numbers 14 and 15, South Dakota Department of Game, Fish and Parks, Pierre.

Sundstrom, L. 1989. Culture history of the Black Hills with reference to adjacent areas of the northern Great Plains. J & L Reprint Company, Lincoln, NE.

Tallman, D.A., D.L. Swanson, and J.S. Palmer. 2002 Birds of South Dakota. South Dakota Ornithologist's Union, Midstates/Quality Quick Print, Aberdeen, SD.

Terres, J.K. 1991. The Audubon Society encyclopedia of North American birds. Wings Books, New York.

Thompson, K.A., C.D. Pierskalla, and M.A. Schuett. 2007. Management perceptions of off-highway vehicle use on National Forest System lands in Appalachia. Proceedings of the 2007 Northeastern Recreation Research Symposium, GTR-NRS-P-23. pp. 300–305. Available: http://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs-p-23papers/42thompson-p23.pdf

Tobalske, B.W. 1997. Lewis' woodpecker (*Melanerpes lewis*). In the birds of North America, No. 284 (A. Poole and F. Gills, *editors*). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14(1): 18–30.

Tyser, R.W. and C.A. Worley. 1992. Alien flora in grasslands adjacent to road and trail corridors in Glacier National Park, Montana, (USA). Conservation Biology 6(2): 253–262.

Uresk, D.W. and K.E. Severson. 1998. Response of understory species to changes in ponderosa pine stocking levels in the Black Hills. Great Basin Naturalist 58 (4): 312–327.

USDA Forest Service. 1973. Agricultural Handbook 434: National Forest landscape management, volume 1. U.S. Government Printing Office, Washington, D.C.

USDA Forest Service. 1977. Agricultural Handbook 483: National Forest landscape management, volume 2, Chapter 4, Roads. U.S. Government Printing Office, Washington, D.C.

USDA Forest Service. 1995. Agricultural Handbook 701: Landscape aesthetics; A handbook for scenery management, and (2000) landscape aesthetics handbook revision. U.S. Government Printing Office, Washington, D.C. Available: http://www.esf.edu/es/via/. [July 29, 2008].

USDA Forest Service. 1979a. Environmental analysis report, peregrine falcon reintroduction. Rocky Mountain Region, Black Hills National Forest, Harney Ranger District. May 31, 1979. 29p.

USDA Forest Service. 1979b. The recreation opportunity spectrum: A framework for planning, management, and research. General Technical Report PNW-98, Pacific Northwest Forest and Range Experiment Station.

USDA Forest Service. 1982. ROS users guide. Available: www.fs.fed.us/cdt/carrying_capacity/rosguide_1982.pdf

USDA Forest Service. 1987. Project planning - Chapter 60 of the ROS users guide. Available: www.fs.fed.us/cdt/carrying_capacity/ros_project_planning_users_guide_1987.pdf

USDA Forest Service. 1989. Travel order #11, Forest. Available: http://www.fs.fed.us/r2/blackhills/publications/orders/so011-89.pdf. [July 9, 2008].

USDA Forest Service 1991. FSH 2509.18 – Soil management handbook. WO amendment 2509.18 – 91-1. Effective September 3, 1991.

USDA Forest Service 1992. Forest Service handbook FSH 2509.18 – Soil management handbook. R2 supplement no. 2509.18-92-1. Denver, CO. Effective August 15, 1992.

USDA Forest Service. 1996a. Final environmental impact statement for the revised land and resource management plan for the Black Hills National Forest. Black Hills National Forest, Custer, SD. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml. [July 29, 2008].

USDA Forest Service. 2000a. 1997 revised land and resource management plan for the Black Hills National Forest, as amended by the phase I amendment. Black Hills National Forest, Custer, SD. May 2001.

USDA Forest Service. 2000b. Expert interview summary for the Black Hills National Forest land and resource management plan amendment.

USDA Forest Service. 2003. Forest noxious weed management plan, final report. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml. [July 29, 2008].

USDA Forest Service. 2004a. Black Hills National Forest 2003 monitoring and evaluation report. http://www.fs.fed.us/Region 2/blackhills/projects/planning/2003Monitor/all.pdf.

USDA Forest Service. 2004b. Four threats to the health of the Nation's forest and grasslands. Available: http://www.fs.fed.us/projects/four-threats/key-messages/invasive-species.shtml. [July 9, 2008].

USDA Forest Service. 2005a. Final environmental impact statement for the phase II amendment to the 1997 revised land and resource management plan for the Black Hills National Forest. Black Hills National Forest, Custer, SD. Available on-line at http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml.

USDA Forest Service. 2005b. Record of decision for the phase II amendment to the 1997 revised land and resource management plan for the forest. Custer, SD. October 2005. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml. [July 29, 2008].

USDA Forest Service. 2005c. Off-highway vehicle recreation in the United States, regions and states: A national report from the national survey on recreation and the environment (NSRE). Southern Research Station. June 2005. Available: http://www.fs.fed.us/r2/blackhills/recreation/Travel%20Management/OHV_final_report.pdf

USDA Forest Service. 2005d. Guidelines for engineering analysis of motorized mixed use on National Forest System roads. Engineering Staff Publication EM-7700-30, December 2005. Available: http://www.fs.fed.us/eng/transp/em770030.htm

USDA Forest Service. 2006a. 1997 revised land and resource management plan for the Black Hills National Forest, as amended by the phase II amendment. Black Hills National Forest, Custer, SD. Available on-line at http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml

USDA Forest Service. 2006b. Black Hills National Forest FY2005 monitoring and evaluation report. Black Hills National Forest. September 2006. http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml

USDA Forest Service. 2006c. FSH 2509.25 – Watershed conservation practices handbook. Rocky Mountain Region (R-2), Denver, CO. 58p.

USDA Forest Service. 2007a. Forest-wide travel analysis report. Black Hills National Forest, Custer, SD. September.

USDA Forest Service. 2007b. Black Hills National Forest FY2006 monitoring and evaluation report. Black Hills National Forest. May. Available: http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml

USDA Forest Service. 2007c. Forest Service Manual 2600 – Wildlife, fish, and sensitive plant habitat management, Chapter 2670 – Threatened, endangered and sensitive plants and animals, Region 2 supplement no. 2600-2007-1. Denver, CO. Effective June 8, 2007.

USDA Forest Service. 2008. Final environmental impact statement: Public wheeled motorized travel management EIS. Eldorado National Forest. March. Available: http://www.fs.fed.us/r5/eldorado/projects/route/feis/index.shtml

USDA Forest Service. 2008b. Off-highway vehicle recreation in the United States and its regions and states: A national report from the national survey on recreation and the environment (NSRE). Available: http://www.fs.fed.us/recreation/programs/ohv/IrisRec1rpt.pdf

USDA Forest Service. 2008c. National visitor use monitoring results, national summary report, data collected through FY 2007. Last updated 28 October 2008. Available: http://www.fs.fed.us/recreation/programs/nvum/nvum_national_summary_fy2007.pdf

USDI Fish and Wildlife Service. 1984. American peregrine falcon Rocky Mountain/southwest population recovery plan. Denver, CO.

USDI Fish and Wildlife Service. 2000. 12-month finding for a petition to list the black-tailed prairie dog as threatened. *Federal Register* 65(24): 5476–5488.

USDI Fish and Wildlife Service. 2002. Birds of conservation concern. Division of Migratory Bird Management, Arlington, VA. Available: http://migratorybirds.fws.gov/reports/bcc2002.pdf

USDI Fish and Wildlife Service. 2007a. Threatened and endangered species on the Black Hills National Forest. Wyoming Field Office, August 8.

USDI Fish and Wildlife Service. 2007b. Endangered species by county list. Mountain-Prairie Region, South Dakota Ecological Service Field Office. Updated December 18, 2007; accessed April 10, 2008.

USDI National Park Service. 1994. Report to Congress – Report on effects of aircraft overflights on the National Park Service System. (Prepared pursuant to public law 100-91, The National Parks Overflight Act of 1987). September 12,1994. Available: http://www.nonoise.org/library/npreport/intro.htm#top

Vierling, K. 2004. Report on woodpecker breeding in the Jasper Fire. Submitted to the U.S. Forest Service, February 19, 2004. South Dakota School of Mines and Technology, Rapid City. 11p.

Weaver, F.W., T. Anderson, and R. Guralnick. 2006. Combining phylogenetic and ecological niche modeling approaches to determine distribution and historical biogeography of Black Hills mountain snails (Oreohelicidae). Diversity and Distributions 12: 756–766.

Whitaker, J.O. Jr. 1980. National Audubon Society field guide to North American Mammals. Alfred A. Knopf, Inc., New York.

Wiggins, D. 2004. American three-toed woodpecker (*Picoides dorsalis*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/americanthreetoedwoodpecker.pdf [Accessed: June 20, 2005].

Wiggins, D.A. 2005. Brown creeper (*Certhia americana*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/browncreeper.pdf [March 31, 2008]

Wiggins, D. 2005a. Loggerhead shrike (*Lanius ludovicianus*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/loggerheadshrike.pdf [Accessed: June 20, 2005].

Wiggins, D. 2005b. Yellow-billed cuckoo (*Coccyzus americanus*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/yellowbilledcuckoo.pdf [April 16, 2008].

Wiggins, D.A. 2006. Ruffed grouse (*Bonasa umbellus*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/ruffedgrouse.pdf [April 2, 2008].

Appendix D: Content Analysis for Travel Management Planning

Introduction

On November 9, 2005, the USDA Forest Service published in the *Federal Register*, Volume 70, No.216, the final rules and regulations for designating routes and areas for motor vehicle use for travel management activities (*hereafter referred to as* Final Rule) on National Forest System lands to become effective December 9, 2005.

Forest Service regulations at 36 CFR part 212 governing administration of the forest transportation system, and regulations at 36 CFR part 295 governing use of motor vehicles off National Forest System (NFS) roads are combined and clarified in this Final Rule as part 212, Travel Management, covering the use of motor vehicles o NFS lands. These regulations implement Executive Order (EO) 11644 (February 8, 1972), "Use of Off-Road Vehicles on the Public Lands," as amended by EO 11989 (May 24, 1977). These Executive orders direct Federal agencies to ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

Black Hills Travel Management Planning

As a result of the publishing of the Final Rule, the Black Hills National Forest initiated the process to plan and designate routes, trails, and areas available for motor vehicle use. The Forest published a notice of intent (NOI) to prepare an environmental impact statement (EIS) in the *Federal Register*, Volume 72, No. 175, on September 11, 2007. The NOI initiated the scoping process for the environmental analysis (EA) for the Black Hills National Forest Travel Management Plan (*referred to as* Travel Management Plan) by identifying the purpose and need and a proposed action for the project. The notice also identified the responsible official, public involvement, schedule for public meetings, preliminary issues, and expected timeline for the analysis.

In addition to the *Federal Register* publication and news releases to local papers, the Black Hills sent to individuals, agencies, special interest groups, and other interested parties a letter describing the proposed action for designating motor vehicle use on the Black Hills National Forest, including a map of the proposal identifying specific routes, trails, and areas available for motor vehicle use. Larger scale maps were made available to the public through the District Office and Supervisor's Office of the Black Hills National Forest. Four public meetings were held to discuss the proposal and answer specific questions from the public. A comment form developed by the Black Hills National Forest was available to the public to encourage participation in the scoping process.

Summary Comments

During the scoping period, 738 responses were received from the public. The letters were received in three forms: Audubon Society form letter, some with individual comments; individual letters or e-mails; and the Black Hills National Forest OHV form, some with individual comments. Of the 738 letters sent; 60 were the Audubon form, including 14 letters containing no original comments or presented in duplicate from the sender; 217 individual letters, including 23 duplicates from sender; and 460 Black Hills OHV form, including 7 duplicates.

After reviewing the 738 letters, some 1,991 specific comments were identified and grouped. The comments were defined into 16 categories with sub-categories to improve the analysis of the comments

and define clear issue statements. A public concern statement was identified to describe each main category. These public concerns were then used to define issue statements. Issues represent conflicts posed by the proposed action, and are important because they can serve as the basis for alternatives.

The comment categories are summarized below, along with the disposition showing how they were incorporated into the EIS analysis.

Category 1: Add Motorized Routes (404 Comments)

Public Concern: The Forest Service should add trails, roads, and trailheads to the Travel Management Plan as presented by the public for motorized opportunities.

Sub-Categories:

- **Comments wanting ATV routes (25):** These comments focus on the need to have more trail opportunities for less than 50-inch vehicles. Two comments focus on Hell Canyon, including the Pleasant Valley area. There are two comments that believe the 50-inch tread width should be increase to 54-inch or 60-inch.
- **Comments wanting destinations or ties to communities or businesses (10):** These comments ask for connections to services such as gas, food, or other places of business. They request that the road/trail system be developed to connect communities and provide opportunities for points of interest. One commenter requested these communities, business, or points of interest be placed on the map.
- **Comments making general statements about wanting more of everything (60):** General statements include leaving the travel system as it is currently (3), keeping all roads open to motorized travel (9), including plans for future expansion (4), ensuring use of user submitted routes (2), the proposed plan is way too restrictive (concerned with lost motorized opportunities) from the current system (22), the motorized travel system needs to be dispersed throughout and not concentrated in any individual area (3), desired for winter time access (1), and encouragement to use paved, county, or gravel roads for connectors (4).
- **Comments wanting more loops (46):** The desire for these comments is to connect dead-end roads with loops (5) or just to create more looping opportunities in general (35), with specific mention of Hell Canyon needs for looping trails (2), Lead/Deadwood connectors (3) and utilizing county roads for connectors (4). Primary focus was for “trails” and not roads. One comment specifically mentioned less than 50-inch loop trails.
- **Comments wanting more single track trails (64):** Of these comments, four included increasing the single track miles to 300 or 500 or 1000, and nine comments desire single track in specific locations, i.e. Hell Canyon, Rochford, Camp 5, Piedmont, Nemo, Victoria Lake, Sugar Shack, Spearfish, Custer, and Newcastle. Several comments (10) disappointed in the 79 miles proposed, stating that “it would not provide enough enjoyable riding for a weeks stay in the Hills”.
- **Comments requesting specific routes by description or route numbers (122):**
    - All District—usually submitted by spreadsheet from user groups (9)
    - BL (18); 1 comment shared with HC
    - NH (38); with 2 comments shared with BL; 5 with MY; 2 with HC
    - MY (39); with 4 comments shared with NH
    - HC (18); with 3 comments shared with MY; 1 with NH
- **Comments requesting trailheads (8):** Two general comments about trailhead locations, one to place in strategic locations and another to ensure looping opportunities for trails return to a

common parking area. Other comments were for specific locations for trailheads; i.e. Peaceful Pines, Spearfish, Dumont, Pilot knob, Rochford, junction of Custer Crossing and Minnesota Ridge Road, Mad Mountain Adventures and Experimental Forest area.

- **Comments requesting trails for both ATV and motorcycles (48):** There were 48 comments requesting more trails for a variety of motorized uses, including rock crawlers (5), ATV use (2), comments for both motorcycles and ATV (19), and desire for trails in general rather than roads (21). Trails in general also include specific locations Hell Canyon (2), Bearlodge (1) and Northern Hills (1).
- **Comments wanting consideration for UTV (6):** Six comments received to include utility terrain vehicles in with all-terrain vehicles for trail designation. There desire is for the less than 50-inch designation to increase to either 54-inch or 60-inch.
- **Comments requesting year-round access (16):** Sixteen comments were received for year-round use of the proposed motorized travel system. Of these, five were specific for winter access; one because of a business.

Disposition: *The comments in this category reflect the purpose and need for this project, which calls for the development and designation of a motorized travel system. Many comments also request the Forest to provide a variety of motorized recreation opportunities. These comments were generally incorporated into Issue 2, Effects on Recreation Opportunities.*

Category 2: Remove Motorized Routes (292 Comments)

Public Concern: The Forest Service should remove specific motorized trails, roads, and trailheads from the Travel Management Plan as presented by the public.

Sub-Categories:

- **Comments wanting removal of dead end spurs (22):** Comments request elimination, obliteration, or decommissioning of dead-end spurs to prevent user-created loops (8). These dead-end routes are seen as “go nowhere” and encourage users to “break the rules”. To facilitate enforcement, comments recommend removing dead-end spurs from the map unless they lead to a destination.

Disposition: *Comments in this category call for the development of a motorized travel system that could reasonably be maintained and enforced. These comments were incorporated into Issue 3, Effects on Management Capabilities.*

- **Comments making general statements about wanting less of everything (98):** Comments focused on a need to reduce the overall miles available for roads and trails to the motorized vehicles. Comments included 54 statements to reduce the road miles; 17 to reduce the trail opportunities for ATVs and 4 to reduce motorcycles; and 18 that specifically mention 3,988 miles or 4,000 miles is “way too much”. Reasons for the reduction include 10 concerns for environmental resources; 6 to management concerns to maintain; and 7 for reduction in road density.
- **Comments wanting less loops (4):** These comments request not increasing the opportunities for loops to prevent abuse of the land and conflicts with the general public.
- **Comments requesting specific routes removed by description or route numbers (158):**
    - All District—usually submitted by spreadsheet from user groups (6)
    - BL (8); 3 comments shared with HC
    - NH (76); with 2 comments shared with BL; 2 with MY; 1 with HC

  - MY (51); with 1 comment shared with NH; 2 with HC
  - HC (13)
- **Comments requesting removal of trailheads (5 specific to Peaceful Pines) (11):** These comments recommend removing specific proposed trailhead locations.

Disposition: *These comments reflect concerns for effects of motorized travel use on natural resources. They were incorporated into Issue 1, Effects on Natural and Cultural Resources.*

Category 3: Off-Road Opportunities (327 Comments)

Public Concern: The Forest Service should add motorized off-road opportunities for dispersed camping, game retrieval, cross-country travel, teaching beginners to ride and mud bogging to the Travel Management Plan.

Sub-Categories:

- **Comments wanting areas for off-road use (95):** These comments request areas be identified to allow off-road opportunities anywhere the rider desires to go. Of the comments; 2 had suggested specific areas (Piedmont and Sheridan Lake); 5 recommended a specific size to consider (1 square mile [2], 15 square miles [1], and 100 acres [2]); 9 wanted areas for motorcycles with 1 specifically requesting small jumps; and 2 requested access to designated system from private property. One comment wanted to ensure the Prairie Creek decision was incorporated into the new Plan. Another comment suggested areas be set up for winter cross-country opportunities.
- **Comments wanting areas set up to teach beginners ("tot lots") (12):** These comments request areas, sometimes refer to as a "play area", to provide beginners a place to learn to ride and develop skills. Two comments recommended gravel pits as a suitable place.
- **Comments specifically supporting dispersed camping (103):**
  - 60 comments specifically requesting 300 feet
  - other comments ranged between 150 to 1,000 feet
  - 2 comments for less than 100 feet
- **Comments specific for wanting game retrieval (93):**
  - Request for increasing the distance; distances were from 500 feet to unlimited
- **Comments wanting mud-bogging (24):** These comments believe that mud bogging areas should be identified to reduce enforcement concerns or user-created ones from occurring (3). Two comments specifically state that "man-made mud bogs" could be built and one recommended the Farmingdale area.

Disposition: *These comments express desires for various forms of motorized recreation. They were incorporated into Issue 2, Effects on Recreational Opportunities.*

Category 4: Accessibility (23 Comments)

Public Concern: The Forest Service should consider the needs of the elderly and person with disabilities while designing a motorized travel management plan for the Black Hills National Forest.

Sub-Categories:

- **Comments specific to disability travel (categorized as recreation oriented) (7):** These comments focus on the recreational opportunities of motorized travel for persons with disabilities. Two comments suggest that the proposed designated motorized system would eliminate a large area of the Forest from their access due to inability to hike.

- **Comments related to hunting needs for disability or elderly (16):** These comments also include increasing the distance for game retrieval (5) and designating deer for retrieval (3).

Disposition: *These comments express concerns for various forms of motorized recreation. They were incorporated into Issue 2, Effects on Recreational Opportunities.*

Category 5: Environmental Concerns (93 Comments)

Public Concern: The Forest Service should evaluate impacts from motorized opportunities on environmental resources such as water, soil, wildlife, plants and other resources on the Black Hills National Forest.

Many of the comments received identified more than one resource area of concern for the proposed action for Black Hills motorized travel opportunities. The main resource areas of concern were for soil (7); water (21); wildlife and fish (36); plants (8); and archeological resources (5). Additional comments mentioned air, global warming, monitoring, mining access, private property, research natural areas, wilderness, and sensitive vegetation.

Disposition: *These comments were incorporated into Issue 1, Effects on Natural and Cultural Resources.*

Category 6: Enforcement Concerns (83 Comments)

Public Concern: The Forest Service should evaluate the law enforcement personnel available on the Black Hills to ensure compliance with the travel management plan.

Sub-Categories:

- **Comments concerning enforcement capabilities and wanting stronger enforcement (64):** General concern statements focus on the enforcement of the proposed designated system. Some comments (28) suggest that 4,000 miles of motorized routes will not be enforceable and a strategy or enforcement plan (4) should be developed before implementing the new plan. Some comments (5) recommend that the enforcement capabilities of the Forest should dictate the designation of the motorized system.
- **Comments wanting heavier fines (5):** Comments specifically recommend heavier fines to deter misuse of the system.
- **Comments wanting signs or gates to improve enforcement (14):** Comments recommend signing (10) the designated system of routes and trails and gating closure areas (1) to alleviate problems with lack of enforcement personnel.

Disposition: *Comments in this category call for the development of a motorized travel system that could reasonably be maintained and enforced. These comments were incorporated into Issue 3, Effects on Management Capabilities.*

Category 7: No Off-Road Opportunities (111 Comments)

Public Concern: The Travel Management Plan should limit the motorized opportunities to only trails and roads.

Sub-Categories:

- **Comments against dispersed camping activities (32):** These comments recommend not allowing dispersed camping on the Forest anywhere. Of the 25 comments made, 18 recommend that camping be allowed only in designated campgrounds and 7 comments specifically identify fires as a reason to prevent it.

Disposition: *These comments reflect concerns for effects on natural resources. They were incorporated into Issue 1, Effects to Natural and Cultural Resources.*

- **Comments against any off-road game retrieval (30):** Comments believe hunters should find other means of retrieving their downed animal rather than relying on motorized opportunities. Suggestions were quartering the animal, using hand carts, sleds, horses, or dragging. One comment suggested that hunting should "be an effort".

Disposition: *These comments were incorporated into Issue 2, Effects to Recreational Opportunities.*

- **Comments supporting no mud-bogging activities (22):** These comments generally support the Plan to not designate any mud-bogging areas on the Forest.
- **Comments generally okay with no off-road opportunities (27):** Comments are supportive of not providing any off-road opportunities in the travel plan for the Black Hills National Forest. Comments support restricting the motorized opportunities to designated routes and trails.

Disposition: *Comments in these two sub-categories reflect concerns about impacts to natural resources. They were incorporated into Issue 1, Effects to Natural and Cultural Resources.*

Category 8: Special Permits (39 Comments)

Public Concern: The Travel Management Plan should designate motorized off-road opportunities for Forest Service permitted activities such as grazing and firewood gathering.

Sub-Categories:

- **Comments for firewood collection (31):** Comments concerned about the new designated motorized system would not allow for firewood gathering. Six comments recommend designating a distance, 300 feet, for this activity.
- **Comments about grazing activities (7):** Comments are concerned that the new designated system of motorized travel will affect their ability to administer their grazing permits. One comment was concerned about allotment gates being left open on designated motorized system.
- **Comment about special privilege for trapping activities (1):** One comment requested special consideration for trapping activities.

Disposition: *These comments indicate concerns over possible effects of motorized travel to other Forest programs and multiple-uses on the Forest. Firewood gathering on the Forest would be regulated under other authorities and would not be subject to this decision. Similarly, access by permittees to administer their grazing permits would be governed by the terms of their permit and not this decision. Effects of the alternatives on access for other recreational purposes will be disclosed in the EIS.*

Category 9: Big Game Retrieval (39 Comments)

Public Concern: The Forest Service should incorporate all big game species, including deer, turkey, mountain lion, and mountain goat in the Travel Management Plan for off-road motorized big game retrieval opportunities.

Sub-Categories:

- **Comments wanting to include game retrieval for all species (16):** These comments believe game retrieval should be included for all big game species, with 1 comment specifically requesting turkey; 2 for mountain lions; and 1 for mountain goats.
- **Comments wanting deer to be included with elk retrieval (20):** These comments were specific to including deer within the big game retrieval distance.

- **Special Consideration—Game retrieval based on weight (1); game retrieval for all vehicle types (2); increasing the distance (7); consideration for elderly (2):** One comment suggested that big game retrieval should be based on the weight of the animal. Two comments requested consideration for all types of vehicles to retrieve big game and not restrict to ATV retrieval. The other comments were also included in the above counts because they also identified interested in particular species for retrieval. Recommendations for increasing the distance for game retrieval ranged from 600 feet to 1,000 feet.

Disposition: *Access for retrieval of downed game was considered, and the Forest Service decided to address this issue in various ways in different alternatives. These concerns were incorporated as part of Issue 2, Recreational Opportunities.*

Category 10: Roads Versus Trails (29 Comments)

Public Concern: The Travel Management Plan should consider more motorized trails rather than roads.

Sub-Categories:

- **Comments wanting to use existing roads (9):** These comments object to the building or construction of new trails due to the extensive amounts of roads on the Black Hills National Forest. Recommendations are to utilize only existing roads for the travel management plan.
- **Comments wanting more trails rather than "gravel" roads (20):** These comments prefer the experience of trail riding to road riding. Seven of the comments specifically mention "no gravel roads", while three mention that riding on roads is not much of an experience. One commenter specifically requested that the ORV trail system should not include roads passable to automobiles, while another recommend consideration of logging roads in the travel management plan. Two comments also mentioned the desire for a challenging system and that roads were not capable of providing a "challenged ride".

Disposition: *These comments reflect different preferences for recreational motorized use. They were incorporated into Issue 2, Recreational Opportunities.*

Category 11: General Support (23 Comments)

Public Concern: Some commenters generally supported the Travel Management Plan as proposed.

Sub-Categories:

- Comments generally support various portions of the proposal from working with partnerships, "closing unless open" philosophy, or plans for future expansion. Some comments state "OK" or "generally support".

Disposition: *These comments showed support for different aspects of the proposal, but did not identify reasons. The Forest Service appreciates the comments.*

Category 12: General Disagreement (19 Comments)

Public Concern: Commenters prefer not to be restricted to designated routes.

Sub-Categories:

- **Comments fully disagree with proposal (3):** These comments disagree with all proposed points of the proposed travel management plan.

- **Comments general statements (5):** These comments offer general statements such as "losing freedom of enjoying the Forest", "objection to off-road travel is a problem throughout the Hills", and "eliminate all user supplied input from the proposal".
- **Comments requesting the FS to utilize the "current system" of roads/trails (11):** These comments specifically request to leave the current management strategy "open unless designated closed" for the motorized travel opportunities.

Disposition: *These comments reflect a variety of preferences for recreational motorized use. They were incorporated into Issue 2, Recreational Opportunities.*

Category 13: Multi-Use Conflicts (186 Comments)

Public Concern: The Black Hills National Forest should evaluate conflicts to other users such as noise, impacts to nonmotorized activities, ranchers, residential property, etc., when developing the motorized travel management plan.

- These comments response to conflicts with other uses of the Forest such as nonmotorized opportunities, solitude, safety, private property, communities, economics, and motorized impacts with other motorized users. The majority of these comments focused on noise (82), private property concerns (27), and impacts with nonmotorized users (43).

Disposition: *Concerns reflected in these comments were incorporated into Issue 3, which includes user safety; and Issue 4, Social and Economic Concerns.*

Category 14: Partnerships/Cooperations (117 Comments)

Public Concern: The Forest Service should consider all opportunities for funding, including developing a user fee system to help support the maintenance of the proposed travel management plan.

Sub-Categories:

- **Comments not broken out (usually comments against Governor's Task Force) (28):** Comments generally support working with local, state, and other government offices to develop a motorized travel system. Eleven of the comments object to the formation of the Governor's Task Force with two stating that there was no representative supporting nonmotorized interests.
- **Comments related to funding sources (33):** These comments are split between supporting (13) various means of providing funding to support the motorized system and disagreeing (14) with any outside organization providing funding for a specific interest. Those not supporting a variety of funding sources state that external funding sources could influence the management direction and achieve objections of outside organizations. Two comments recommend utilizing existing funds to provide a balance between all the needs of the Forest. Four comments recommend that users pay for the opportunities.
- **Comments requesting no additional fees added for the system (3):** These comments believe enough taxes are paid for this purpose or not enough of a trail system is offered to make a payment viable.
- **Comments supporting user fees (53):** These comments support user fees or a sticker system for motorized use. Three comments would like to see nonmotorized users with a user fee as well. Thirteen comments request the funds to support the motorized trail system.

Disposition: *These comments generally focus on how any motorized travel system might be implemented. Questions regarding fees, funding sources, and partnerships are outside the scope of the decision to be made on this project, and will be decided after a decision is issued.*

Category 15: Duplicate Records (51 Comments)

Disposition: *This is a records management concern. Disposition does not relate to the issues.*

Category 16: Forms with No Specific Comments (155 Comments)

Sub-Categories:

- Audubon form letter with no additional comments (16)
- OHV form letter with no additional comments (139)

Disposition: *This is a records management concern. Disposition does not relate to the issues.*

How Public Concern Statements Relate to Issues

From the comments and concerns summarized above, the Forest Service identified the following key issues.

Issue 1: Effects on natural and cultural resources.

The alternatives considered in the DEIS may have effects on natural and cultural resources. Effects to these resources will vary between alternatives and are mostly dependent on the miles of roads and trails open to motorized use. Restricting motorized use to a managed system of designated roads and trails, identifying specific seasons of use, and identifying authorized types of vehicle use, would improve protection for these natural and cultural resources. Effects to natural and cultural resources between alternatives are identified in detail in the effects analysis in Chapter 3.

Issue 2: Effects on recreational opportunities.

The alternatives considered in the DEIS may have effects on the amount of available recreational opportunities provided on the Forest, including motorized use on roads and trails, mixed motorized use roads, dispersed camping, big game retrieval, motorized trailheads, and nonmotorized opportunities. Effects to the recreational opportunities by alternative are identified in detail in the effects analysis in Chapter 3.

Issue 3: Effects of transportation system design on management capabilities.

The alternatives considered in the DEIS may have effects on the Forest's ability to proactively designate and manage system roads and trails, while also optimizing recreation experiences. The alternatives considered will have different effects on how the transportation system is able to address management concerns (such as law enforcement, user education, signing, and maintenance) while reducing management costs and focusing limited resources. Addressing many of the management concerns will be dependent on available funding sources, which will most likely be limited. The transportation system design can also affect public safety depending on the miles of mixed use roads. Any roads identified for mixed use will be reviewed in a mixed use roads analysis that includes mitigation to make reasonable accommodations for the public's safety.

Issue 4: Social and Economic Concerns.

The alternatives considered in the DEIS may affect the economic sustainability of local businesses and communities. Effects may be related to dust, noise, traffic level, trespass on private property, distance from motorized routes to private land, and miles of routes open to motorized use.

Appendix E: Cumulative Effects

Following is a partial listing of actions considered in the cumulative effects analysis for this project.

Past, Present, and Reasonably Foreseeable Actions Referred to in Specialist Reports

- Activities such as vegetation management, fuels management, livestock grazing, recreational activities, and other management activities have continued and would continue on the Forest. These activities would likely occur on private lands as well.
- Firewood cutting has occurred in the past and would likely continue in the foreseeable future on the Forest and private lands.
- Private landowners may harvest timber on their lands for lumber or to reduce fire hazards.
- Urban development and interface growth will continue on private lands.
- Management of national and state parks adjacent to the Forest would continue.
- Prairie dog control efforts on private lands have occurred and can be expected to continue.
- Road construction and maintenance and right-of-way brushing can be expected to continue on non-National Forest System land. Road construction, reconstruction, and decommissioning are expected to continue to move towards Forest Plan Objective 309.
- Future road or trail realignment, reconstruction, or decommissioning.
- Recreation activities will continue to increase on the Forest. Future recreation projects may be developed.
- Timber harvest and fuels management projects.
- Grazing allotment management plans are proposed to be revised to incorporate current standards, and will be implemented.
- Treatment to reduce or eliminate noxious weeds.
- Meadow restoration projects.
- Historic and ongoing mining activities.
- Water storage/diversion projects.

Appendix F: Proposed Forest Plan Changes for Travel Planning Alternatives

Alternative B Would Change the Existing Forest Plan Direction in the Following Ways

Note: **Bolded** areas within tables denote a change.

Goal 4, Objective 416:

Existing Language: Maintain and construct trails as displayed in the following table:

Nonmotorized trails (1996)	293 miles
Motorized trails (1996)	14 miles
Nonmotorized trail construction	204 miles
Motorized trail construction, or conversion from road to motorized trail	15 miles (per decade)
Total forest trail system	526 miles (total miles at end of decade)
Reconstruction	100 miles (per decade)

Proposed New Language: Maintain and construct trails as displayed in the following table:

Nonmotorized trails (1996)	293 miles
Motorized trails (2009)	**36 miles**
Nonmotorized trail construction	204 miles
Motorized trail construction, improvement, or conversion from road to motorized trail	**627 miles (per decade)**
Total forest trail system	**1,124 miles (total miles at end of decade)**
Construction/improvement	**650 miles (per decade)**

Goal 4, Objective 421:

Existing Language: Provide the following road system [Roads, by the end of the first decade]:

Suitable for public use	4,700 miles
Passenger car	1,200 miles
High clearance vehicles	3,500 miles
Roads closed to vehicles	500 miles
TOTAL	5,200 miles

Proposed New Language: Provide the following road system [Roads, by the end of the first decade]:

Suitable for public use	**3,500 miles**
Passenger car	639 miles
High clearance vehicles	2,827 miles
Roads closed to vehicles	500 miles
TOTAL	**4,000 miles**

Goal 4, Objective 422:

Existing Language: Provide the following off-road travel opportunities:

Category	% of Forest
All motorized travel allowed yearlong	59.1
Seasonal restrictions apply	22.8
Seasonal restrictions-no off-road	3.2
Backcountry motorized recreation on designated trails	1.0
Only OHV travel prohibited	11.4
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	1.3

Proposed New Language: Provide the following off-road travel opportunities:

Category	% of Forest
Off-road motorized travel allowed yearlong or seasonally (motorized game retrieval and dispersed camping)	**14.2 (dispersed camping is a subset of total game retrieval area)**
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	83

Forestwide Guideline 5301:

Existing Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain."

Proposed New Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain. Motorized dispersed camping is allowed only as shown on the MVUM."

Forestwide Standard 9101:

Existing Language: "Designated and newly constructed Forest Development Roads are open all year to appropriate motorized vehicle use, unless a documented decision shows one or more of the following: …."

Proposed New Language: "Any new road will be closed to public use unless a project decision specifically designates it as open to public use, and until it is so designated on the MVUM."

Forestwide Standard 9102:

Existing Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the Forest Visitor Map or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Proposed New Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the ~~Forest Visitor Map~~ MVUM or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Forestwide Guideline 9103:

Existing Language: "Management of motorized vehicle travel is summarized in the following table." [See table in Plan, pg. II-77]

Proposed New Language: "Management of motorized vehicle travel is summarized in the following table. Motorized off-road travel is allowed only for purposes of game retrieval and dispersed camping, as shown on the MVUM (except for specific exceptions specified in the Travel Rule)."

Forestwide Standard 9302:

Existing Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the Forest Visitor Map or contained in the Forest Travel Orders."

Proposed New Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the MVUM or contained in the Forest Travel Orders."

Management Area Guidelines:

3.31-9102 – ***Existing Language:*** "Off-road motorized travel is allowed on trails only."

Proposed New Language: "Off-road motorized travel is allowed on designated trails only."

5.1-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.1A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.3A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.3A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.4-9101 – ***Existing Language:*** "Off-road motorized travel is prohibited from December 15 through May 15."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision, but is prohibited from December 15 through May 15."

5.4-9102 – ***Existing Language:*** "Motorized road travel may be restricted."

Proposed New Language: "Motorized road travel is allowed where designated."

5.6-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.6-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

Alternative C Would Change the Existing Forest Plan Direction in the Following Ways

Goal 4, Objective 416:

Existing Language: Maintain and construct trails as displayed in the following table:

Nonmotorized trails (1996)	293 miles
Motorized trails (1996)	14 miles
Nonmotorized trail construction	204 miles
Motorized trail construction, or conversion from road to motorized trail	15 miles (per decade)
Total forest trail system	526 miles (total miles at end of decade)
Reconstruction	100 miles (per decade)

Proposed New Language: Maintain and construct trails as displayed in the following table:

Nonmotorized trails (1996)	293 miles
Motorized trails (2009)	**36 miles**
Nonmotorized trail construction	204 miles
Motorized trail construction, improvement, or conversion from road to motorized trail	**735 miles (per decade)**
Total forest trail system	**1,232 miles (total miles at end of decade)**
Construction/improvement	**750 miles (per decade)**

Goal 4, Objective 421:

Existing Language: Provide the following road system [Roads, by the end of the first decade]:

Suitable for public use	4,700 miles
Passenger car	1,200 miles
High clearance vehicles	3,500 miles
Roads closed to vehicles	500 miles
TOTAL	5,200 miles

Proposed New Language: Provide the following road system [Roads, by the end of the first decade]:

Suitable for public use	**3,600 miles**
Passenger car	**643 miles**
High clearance vehicles	**2939 miles**
Roads closed to vehicles	**1,300 miles**
TOTAL	**4,900 miles**

Goal 4, Objective 422:

Existing Language: Provide the following off-road travel opportunities:

Category	% of Forest
All motorized travel allowed yearlong	59.1
Seasonal restrictions apply	22.8
Seasonal restrictions-no off-road	3.2
Backcountry motorized recreation on designated trails	1.0
Only OHV travel prohibited	11.4
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	1.3

Proposed New Language:

Provide the following off-road travel opportunities:

Category	% of Forest
Off-road motorized travel allowed yearlong or seasonally (motorized game retrieval and dispersed camping)	**38 (dispersed camping overlaps but is not a subset of game retrieval area)**
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	**60**

Forestwide Guideline 5301:

Existing Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain."

Proposed New Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain. Motorized dispersed camping is allowed only as shown on the MVUM."

Forestwide Standard 9101:

Existing Language: "Designated and newly constructed Forest Development Roads are open all year to appropriate motorized vehicle use, unless a documented decision shows one or more of the following: …."

Proposed New Language: "Any new road will be closed to public use unless the project decision approving its construction specifically designates it as open to public use, and until it is so designated on the MVUM."

Forestwide Standard 9102:

Existing Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the Forest Visitor Map or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Proposed New Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road, and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the ~~Forest Visitor Map~~ MVUM or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Forestwide Guideline 9103:

Existing Language: "Management of motorized vehicle travel is summarized in the following table." [See table in Plan, pg. II-77]

Proposed New Language: "Management of motorized vehicle travel is summarized in the following table. Motorized off-road travel is allowed only for purposes of game retrieval and dispersed camping, as shown on the MVUM (except for specific exceptions specified in the Travel Rule)."

Forestwide Standard 9302:

Existing Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the Forest Visitor Map or contained in the Forest Travel Orders."

Proposed New Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the MVUM or contained in the Forest Travel Orders."

Management Area Guidelines:

3.31-9102 – ***Existing Language:*** "Off-road motorized travel is allowed on trails only."

Proposed New Language: "Off-road motorized travel is allowed on designated trails only."

3.7-9103 – ***Existing Language:*** "Off-road motorized travel is prohibited."

Proposed New Language: "Off-road motorized travel is allowed only where designated."

5.1-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.1A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.3A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.3A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.4-9101 – ***Existing Language:*** "Off-road motorized travel is prohibited from December 15 through May 15."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision, but is prohibited from December 15 through May 15."

5.4-9102 – ***Existing Language:*** "Motorized road travel may be restricted."

Proposed New Language: "Motorized road travel is allowed where designated."

5.6-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.6-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

Alternative D Would Change the Existing Forest Plan Direction in the Following Ways

Goal 4, Objective 416:

Existing Language:

Maintain and construct trails as displayed in the following table:

Nonmotorized trails (1996)	293 miles
Motorized trails (1996)	14 miles
Nonmotorized trail construction	204 miles
Motorized trail construction, or conversion from road to motorized trail	15 miles (per decade)
Total forest trail system	526 miles (total miles at end of decade)
Reconstruction	100 miles (per decade)

Proposed New Language: Maintain and construct trails as displayed in the following table:

Nonmotorized trails (1996)	293 miles
Motorized trails (2009)	**36 miles**
Nonmotorized trail construction	204 miles
Motorized trail construction, improvement, or conversion from road to motorized trail	**284 miles (per decade)**
Total forest trail system	**781 miles (total miles at end of decade)**
Construction/improvement	**320 miles (per decade)**

Goal 4, Objective 421:

Existing Language: Provide the following road system [Roads, by the end of the first decade]:

Suitable for public use	4,700 miles
Passenger car	1,200 miles
High clearance vehicles	3,500 miles
Roads closed to vehicles	500 miles
TOTAL	5,200 miles

Proposed New Language: Provide the following road system [Roads, by the end of the first decade]:

Suitable for public use	**2,900 miles**
Passenger car	**636 miles**
High clearance vehicles	**2,241 miles**
Roads closed to vehicles	**2,100 miles**
TOTAL	**5,000 miles**

Goal 4, Objective 422:

Existing Language: Provide the following off-road travel opportunities:

Category	% of Forest
All motorized travel allowed yearlong	59.1
Seasonal restrictions apply	22.8
Seasonal restrictions-no off-road	3.2
Backcountry motorized recreation on designated trails	1.0
Only OHV travel prohibited	11.4
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	1.3

Proposed New Language: Provide the following off-road travel opportunities:

Category	% of Forest
Off-road motorized travel allowed yearlong or seasonally (motorized game retrieval and dispersed camping)	**0.0 (no motorized dispersed camping or game retrieval allowed)**
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	**98**

Forestwide Guideline 5301:

Existing Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain."

Proposed New Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain. Motorized dispersed camping is allowed only as shown on the MVUM."

Forestwide Standard 9101:

Existing Language: "Designated and newly constructed Forest Development Roads are open all year to appropriate motorized vehicle use, unless a documented decision shows one or more of the following: …."

Proposed New Language: "Any new road will be closed to public use unless the project decision approving its construction specifically designates it as open to public use, and until it is so designated on the MVUM."

Forestwide Standard 9102:

Existing Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the

Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the Forest Visitor Map or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Proposed New Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the ~~Forest Visitor Map~~ MVUM or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Forestwide Guideline 9103:

Existing Language: "Management of motorized vehicle travel is summarized in the following table." [See table in Plan, pg. II-77]

Proposed New Language: : "Management of motorized vehicle travel is summarized in the following table. No motorized off-road game retrieval or dispersed camping is allowed."

Forestwide Standard 9302:

Existing Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the Forest Visitor Map or contained in the Forest Travel Orders."

Proposed New Language "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the MVUM or contained in the Forest Travel Orders."

Management Area Guidelines:

3.31-9102 – ***Existing Language:*** "Off-road motorized travel is allowed on trails only."

Proposed New Language: "Off-road motorized travel is allowed on designated trails only."

5.1-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.1A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.3A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.3A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.4-9101 – ***Existing Language:*** "Off-road motorized travel is prohibited from December 15 through May 15."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision, but is prohibited from December 15 through May 15."

5.4-9102 – ***Existing Language:*** "Motorized road travel may be restricted."

Proposed New Language: "Motorized road travel is allowed where designated."

5.6-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.6-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

Alternative E Would Change the Existing Forest Plan Direction in the Following Ways

Goal 4, Objective 422:

Existing Language: Provide the following off-road travel opportunities:

Category	% of Forest
All motorized travel allowed yearlong	59.1
Seasonal restrictions apply	22.8
Seasonal restrictions-no off-road	3.2
Backcountry motorized recreation on designated trails	1.0
Only OHV travel prohibited	11.4
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	1.3

Proposed New Language: Provide the following off-road travel opportunities:

Category	% of Forest
Off-road motorized travel allowed yearlong or seasonally (motorized game retrieval and dispersed camping)	**0.0 (no motorized dispersed camping or game retrieval allowed)**
Motorized travel prohibited except snowmobiles	1.2
All motorized travel prohibited	**98**

Forestwide Guideline 5301:

Existing Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain."

Proposed New Language: "Discourage dispersed camping within a minimum of 100 feet from lakes and streams unless exceptions are justified by terrain. Motorized dispersed camping is allowed only as shown on the MVUM."

Forestwide Standard 9101:

Existing Language: "Designated and newly constructed Forest Development Roads are open all year to appropriate motorized vehicle use, unless a documented decision shows one or more of the following: …..."

Proposed New Language: "Any new road will be closed to public use unless the project decision approving its construction specifically designates it as open to public use, and until it is so designated on the MVUM."

Forestwide Standard 9102:

Existing Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the Forest Visitor Map or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Proposed New Language: "With regard to management of motorized travel, management areas are designated as allowed, restricted, or prohibited for road, off-road, and snow travel. The need for modifying motorized travel opportunities within management areas may be identified during project planning and will be accomplished through project decisions. Existing travel orders will continue in effect as part of the Revised Forest Plan unless changed by management area direction. Motorized off-highway vehicle travel opportunities and restrictions, both those listed in the table below and any modified through project decisions, will be displayed on the ~~Forest Visitor Map~~ MVUM or contained in a Forest Travel Order. Implementation of Forest Travel Orders on the ground shall be in compliance with the Forest Access Management Guide."

Forestwide Guideline 9103:

Existing Language: "Management of motorized vehicle travel is summarized in the following table." [See table in Plan, pg. II-77]

Proposed New Language: "Management of motorized vehicle travel is summarized in the following table. No motorized off-road dispersed camping or game retrieval is permitted."

Forestwide Standard 9302:

Existing Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the Forest Visitor Map or contained in the Forest Travel Orders."

Proposed New Language: "The need to modify existing allowable trail uses or to identify use types of new Forest Development Trails will be accomplished through project planning and project decisions. Trail use opportunities, both those listed in the table below, and any added or modified through project decisions will be displayed on the MVUM or contained in the Forest Travel Orders."

Management Area Guidelines:

3.31-9102 – ***Existing Language:*** "Off-road motorized travel is allowed on trails only."

Proposed New Language: "Off-road motorized travel is allowed on designated trails only."

5.1-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.1A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.1A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.3A-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.3A-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

5.4-9101 – ***Existing Language:*** "Off-road motorized travel is prohibited from December 15 through May 15."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision, but is prohibited from December 15 through May 15."

5.4-9102 – ***Existing Language:*** "Motorized road travel may be restricted."

Proposed New Language: "Motorized road travel is allowed where designated."

5.6-9101 – ***Existing Language:*** "Off-road motorized travel is allowed unless restricted by a project decision."

Proposed New Language: "Off-road motorized travel is allowed where designated by a project decision."

5.6-9102 – ***Existing Language:*** "Motorized road travel is allowed unless restricted by a project decision."

Proposed New Language: "Motorized road travel is allowed where designated by a project decision."

Appendix G: Glossary

All-terrain vehicle (ATV) ~ A type of off-highway vehicle that travels on three or more low-pressure tires; has handle-bar steering; is less than or equal to 50 inches in width; and has a seat designed to be straddled by the operator (FSM 7700).

Area ~ A discrete, specifically delineated space that is smaller, and in most cases much smaller, than a ranger district (36 CFR 212.1).

Arterial road ~ An NFS road that provides service to large land areas and usually connects with other arterial roads or public highways.

Background ~ The distant part of a landscape. The landscape area located from 4 miles to infinity from the viewer.

Big game ~ Large wild animals that are hunted for sport and food. This hunting is controlled by state wildlife agencies. Big game animals found on this Forest include deer and elk.

Collector road ~ An NFS road that services smaller areas than an arterial road and that usually connects arterial roads to local roads or terminal facilities.

Corridor (landscape) ~ Landscape element that connect similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a conifer forest.

Cumulative effects ~ Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Designated road, route, trail, or area ~ An NFS road, NFS trail, or an area on NFS lands that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map (36 CFR 212.1).

Distance zones ~ Landscape areas denoted by specific distances from the observer. Used as a frame of reference in which to discuss landscape attributes or the scenic effect of human activities in a landscape.

Foreground ~ Detailed landscape generally found from the observer to 0.5-mile away. See also "Immediate foreground."

Forest road or trail ~ A road or trail wholly or partially within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (36 CFR 212.1).

Forest transportation atlas ~ A display of the system of roads, trails, and airfields of an administrative unit (36 CFR 212.1).

Forest transportation facility ~ A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system (36 CFR 212.1).

Forest transportation system ~ The system of NFS roads, trails, and airfields on NFS lands (36 CFR 212.1).

Highway-legal vehicle ~ Any motor vehicle that is licensed or certified under State law for general operation on all public roads within the State. Operators of highway-legal vehicles are subject to state traffic law, including requirements for operator licensing (FSM 7700).

Immediate foreground ~ The detailed feature landscape found within the first few hundred feet of the observer, generally, from the observer to 300-feet away.

Indicator ~ In effects analysis, a device for measuring effects from management alternatives on a particular resource or issue.

Local road ~ A NFS road that connects a terminal facility with collector roads, arterial roads, or public highways and that usually serves a single purpose involving intermittent use.

Maintenance level (ML) ~ Defined in FSH 7709.58, 10, 12. 3 as the level of service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with road management objectives, and maintenance criteria. Roads may be maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the standard to which the road is currently being maintained. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns.

Maintenance level 1 road ~ Defined in FSH 7709.58, 10, 12. 3 as intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate." Roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for nonmotorized uses. These roads have the following attributes: (1) vehicular traffic is eliminated, including administrative traffic; (2) physically blocked or entrance is disguised; (3) not subject to the requirements of the Highway Safety Act; (4) maintenance is done only to minimize resource impacts; and (5) no maintenance other than a condition survey may be required so as long as no potential exists for resource damage.

Maintenance level 2 road ~ Defined in FSH 7709.58, 10, 12.3 as roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either (1) discourage or prohibit passenger cars or (2) accept or discourage high-clearance vehicles. These roads have the following attributes: (1) low traffic volume and low speed; (2) typically local roads; (3) typically connect collectors and other local roads; (4) dips are the preferred drainage treatment; (5) not subject to the requirements of the Highway Safety Act; (6) surface smoothness is not a consideration; and (7) not suitable for passenger cars.

Maintenance level 3 road ~ Defined in FSH 7709.58, 10, 12.3 as roads open and maintained for travel by prudent drivers in a standard passenger car. User comfort and convenience are low priorities. Roads in this maintenance level are typically low speed, single lane with turnouts, and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies

are either “encourage” or “accept.” “Discourage” or “prohibit” strategies may be employed for certain classes of vehicles or users. These roads have the following attributes: (1) subject to the requirements of the Highway Safety Act and Manual of Uniform Traffic Control Devices (MUTCD); (2) roads have low to moderate traffic volume; (3) typically connect arterial and collector roads; (4) a combination of dips and culverts provide drainage; (5) may include some dispersed recreation roads; and (6) potholing or washboarding may occur.

Maintenance level 4 road ~ Defined in FSH 7709.58, 10, 12.3 as roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is “encourage.” However, the “prohibit” strategy may apply to specific classes of vehicles or users at certain times. These roads have the following attributes: (1) subject to requirements of the Highway Safety Act and MUTCD; (2) roads have moderate traffic volume and speeds; (3) may connect to county roads; (4) culverts provide drainage; (5) usually a collector; and (6) may include some developed recreation roads.

Maintenance level 5 road ~ Defined in FSH 7709.58, 10, 12.3 as roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is “encourage.” These roads have the following attributes: (1) subject to the requirements of the Highway Safety Act and MUTCD; (2) highest traffic volume and speeds; (3) typically connect State and county roads; (4) culverts provide drainage; (5) usually arterial and collector; (6) may include some developed recreation roads; and (7) usually paved or chip-sealed.

Middleground ~ The zone between the foreground and the background in a landscape. The area located from 0.5 to 4 miles from the observer.

Mixed-use road ~ Segments of NFS roads that are identified and signed as open to state licensed and unlicensed vehicles; generally more than 50 inches in width and usually, but not always, low maintenance roads with no high-speed traffic.

Motor vehicle ~ Any vehicle which is self-propelled, other than: (a) a vehicle operated on rails; and (b) any wheelchair or mobility device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area (36 CFR 212.1).

Motor vehicle use map (MVUM) ~ A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the NFS (36 CFR 212.1).

Motorcycle ~ A two-wheeled motor vehicle on which the two wheels are not side-by-side but in line (FSM 7700).

Motorized mixed use ~ Designation of an NFS road for use by both highway-legal and non-highway legal motor vehicles (FSM 7700).

Motorized trail ~ A travelway usually, but not always, less than 50 inches in width usually, but not always, available for use by all-terrain vehicles (ATVs) and/or motorcycles. These travelways may also be made available to high-clearance four-wheel drive vehicles, and may also be used by bicycles, horses, and hikers.

MVUM ~ See “Motor vehicle use map.”

Natural scenery ~ The landforms including rock outcrops, vegetation, and animals that are naturally found in this ecosystem.

National Forest System road ~ A forest road other than a road which has been authorized by a legally documented right-of-way held by a state, county, or local public road authority (36 CFR 212.1).

National Forest System trail ~ A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a state, county, or local public road authority (36 CFR 212.1).

No Action (Alternative) ~ The most likely condition expected to exist if current management practices continue unchanged. The analysis of this alternative is required for Federal actions under NEPA.

Non-highway-legal vehicle ~ Any motor vehicle that is not licensed or certified under state law for general operation on all public roads within the state. Operators of non-highway-legal vehicles are subject to state requirements, if any, for licensing and operation of the vehicle in question (FSM 7700).

Off-highway vehicle (OHV) ~ Any motor vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain (36 CFR 212.1).

Off-road vehicle (ORV) ~ See "Off-highway vehicle."

Over-snow vehicle (OSV) ~ A motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow (36 CFR 212.1).

Private road ~ A road under private ownership authorized by an easement granted to a private party or a road that provides access pursuant to a reserved or outstanding right.

Public road ~ The road under the jurisdiction of and maintained by a public road authority and open to public travel (23 U.S.C. 101 (a)).

Primitive ~ A Recreation Opportunity Spectrum classification for areas characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.

Proposed Action ~ A proposal made by the FS or other Federal agency to authorize, recommend, or implement an action to meet a specific purpose and need.

Qualified engineer ~ An engineer who by experience, certification, education, or license is technically trained and experienced to perform the engineering tasks specified and is designated by the Director of Engineering, Regional Office.

Recreation Opportunity Spectrum (ROS) ~ A framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into seven classes—primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, roaded natural nonmotorized, rural, and urban. These are defined in this Glossary under their individual entries.

Road ~ A motor vehicle route over 50-inches wide, unless identified and managed as a trail (36 CFR 212.1).

Road construction or reconstruction ~ Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road (36 CFR 212.1).

Road decommissioning ~ Activities that result in restoration of unneeded roads to a more natural state (FSM 7734).

Road maintenance ~ Ongoing upkeep of a road necessary to maintain or restore the road in accordance with its road management objectives (FSM 7714).

Road Subject to the Highway Safety Act ~ An NFS road that is open to public use in a standard passenger car, including a road with access restricted on a seasonal basis and a road closed during extreme weather conditions or for emergencies, but which is otherwise open to public travel.

Roaded Natural ~ ROS classification for areas characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes 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 harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

Roaded Natural Nonmotorized ~ ROS classification for areas characterized as closed to motorized use yet which have been heavily modified or are not large enough to be set aside as semi-primitive nonmotorized.

ROS ~ See "Recreation Opportunity Spectrum."

Route ~ A road or trail.

Rural ~ ROS classification for areas characterized by a natural environment that has been substantially modified by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.

Scenic Integrity Objective (SIO) ~ Management objectives that were adopted from the scenic class values. Scenic Integrity is a measure of the degree to which a landscape is visually perceived to be "complete". The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the character valued by constituents for its aesthetic appeal.

> **Very high ~** A scenic integrity level that generally provides for ecological change only.
>
> **High ~** A scenic integrity level meaning human activities are not visually evident. In high scenic integrity areas, activities may only repeat attributes of form, line, color and texture found in the existing landscape character.
>
> **Moderate ~** A scenic integrity level that refers to landscapes where the valued landscape character "appears slightly altered". Noticeable deviations must remain visual subordinate to the landscape character being viewed.

Low ~ A scenic integrity level that 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, effect, and pattern of natural opening, vegetative type changes or architectural styles within or 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.

Very low ~ A scenic integrity level that refers to landscapes where the valued landscape character "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Unacceptably low ~ A scenic integrity level that refers to landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any line, form, color, texture, pattern or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. This level should only be used to inventory existing integrity. It must not be used as a management objective.

Scoping ~ The process the Forest Service uses to determine, through public involvement, the range of issues that the planning process should address.

Semi-primitive motorized ~ ROS classification for areas characterized by predominantly natural or natural-appearing environment of moderate to large size. 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 primitive roads with predominantly natural surfaces and trails suitable for motorcycles is permitted.

Semi-primitive nonmotorized ~ ROS classification for areas characterized by predominantly 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 restricts may be present, but would be subtle. Motorized recreation us is not permitted, but local roads used for other resource management activities may be present on a limited bases. Use of such roads is restricted to minimize impacts on recreational experience opportunities.

Temporary road or trail ~ A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or a forest trail and that is not included in a forest transportation atlas (36 CFR 212.1).

Terminal facility ~ A transfer point between the forest transportation system and forest resources served by the system or between different transportation modes, including parking areas, boat ramps and docks, trailheads, marine access facilities, airfields, and heliports (FSM 7705).

Trail ~ A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail (36 CFR 212.1).

Travel management atlas ~ An atlas that consists of a forest transportation atlas and a motor vehicle use map or maps (36 CFR 212.1).

Unauthorized road or trail ~ A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas (36 CFR 212.1).

Unauthorized route ~ Could refer to either an unauthorized road or unauthorized trail, or (plural) both.

Urban ~ ROS classification for areas characterized by a substantially urbanized environment although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreational activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant on the site. Large numbers of users can be expected both on the site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

Wheelchair or mobility device ~ A device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area. A person whose disability requires use of a wheelchair or mobility device may use a wheelchair or mobility device that meets this definition anywhere foot travel is permitted (Title V, sec. 507c, of the ADA).

Appendix H: U.S. Forest Service Region 2 Sensitive Plant Species Known from the Black Hills with Rationale for Further Analysis

Scientific Name/ Common Name/ Plant Code	Global rank; SD State rank; WY State rank	Black Hills Distribution and Habitat	Known to Occur in Project Area	Suitable Habitat in Project Area	Analyzed Further
Botrychium campestre/ prairie moonwort, Iowa moonwort/ BOCA5	G3/G4; SD-S1; WY-S1	*Botrychium campestre* ranges from the Great Lakes, across Iowa and Nebraska to eastern Colorado and northward to Alberta and Saskatchewan. Rangewide the species occurs primarily on well-drained soils in non-forested habitats, occasionally under shrubs in or at the margins of these habitats. Seven occurrences have been confirmed on BKF lands. Additional sites exist on private land and at Wind Cave National Park. *Botrychium campestre* is extremely inconspicuous. Rangewide, it is considered a grassland species associated with sandy grassland habitats in prairies, dunes, railroad sidings, and fields over limestone. Black Hills sites occur on substrates with at least some component of limestone and are primarily in open grassland habitats usually with high forb diversity and sometimes with a high percentage of bare and rocky soils. Little bluestem (*Schizachyrium scoparium*) and western snowberry (*Symphoricarpos occidentalis*) occur at the majority of sites. Black Hills occurrences range in elevation from 3,870 to 5,640 feet.	Yes	Unknown because suitable habitat is not yet defined; analyzed in effects analysis	Yes

Botrychium lineare/ narrowleaf grapefern, slender moonwort/ BOLI7	G2?; SD-S1; WY-S1	*Botrychium lineare* is historically known from California and Utah and currently from Colorado northward to Washington and Montana and Alaska and the Yukon Territory. Western populations of the species occur primarily on limestone substrates in a variety of habitats including heavily forested sites and grassy meadows, fen-like seeps and gravelly roadsides. Five occurrences have been confirmed on BKF lands. All sites occur in open conditions on limestone substrate. Two sites are located on old (estimated 15-25 years) native surface roadbeds. A third site is located adjacent to a gravel roadbed in open grassland. A fourth site, located on a large, open, north-facing, little bluestem dominated hillside, is not associated with any road development. A fifth site, also not associated with any road development, is located in an open forb dominated area on the bank of a small perennial stream. Elsewhere in its range, this species has often been documented in areas of road disturbances and other human and natural disturbances. Black Hills occurrences range in elevation from 4,200 (in Wind Cave National Park) to 6,160 feet.	Yes	Unknown because suitable habitat is not yet defined; analyzed in effects analysis	Yes
Carex alopecoidea/ foxtail sedge/ CAAL8	G5; SD-S2; WY-S2	*Carex alopecoidea* is widely distributed from eastern to central Canada, the northeastern United States, the Great Lakes region south to Tennessee, and west to North Dakota and the Black Hills of South Dakota and Wyoming. Rangewide, habitat includes seasonally saturated meadows and openings in alluvial woods and stream banks, usually over calcareous substrates. In the Black Hills, *Carex alopecoidea* is currently known from two general areas: The Cement Ridge area along the South Dakota-Wyoming border, and in the Bear Lodge Mountains in Wyoming. *Carex alopecoidea* is primarily found along open, perennial streams, often with old beaver dams or ponds. Occurrences have also been found in spruce dominated riparian areas and in drainages with dense shrub cover. Plants are primarily documented in the transitional areas between saturated soils and the more mesic upland areas. Black Hills occurrences range in elevation from 3,840 to 5,900 feet.	Yes	Yes	Yes

Cypripedium parviflorum/ lesser yellow lady's slipper/ CYPA19	G5; SD-S3; WY-S2	*Cypripedium parviflorum* is primarily circumboreal in distribution and rangewide is generally found in shady deciduous and mixed woodlands near streams, shrublands, swamps, bogs, and wet forests. Habitat in the Black Hills includes stream banks under both spruce and deciduous overstories, moist cliffs (usually north-facing), and moist areas/seeps under white spruce (*Picea glauca*) or mixed conifer forest. Occasionally, found on upper mesic forest slopes. Black Hills occurrences range in elevation from 3,500 to 6,500 feet.	Yes	Yes	Yes
Epipactis gigantea/ giant helleborine/ EPGI	G4; SD-S1; WY-S1	*Epipactis gigantea* occurs in western North America from British Colombia south to California, and east to Texas. Rangewide, *Epipactis gigantea* is known from wet meadows, seepage slopes, and the base of cliffs along streams and rivers. In the colder northern portions of its range, the species may be confined to warm springs habitats. In the Black Hills it is known only from Cascade Springs in Fall River County, South Dakota, at 3,400 feet. It is likely dependent upon the constant moisture and warmth provided by the springs. No other warm springs are known on Forest Service-administered land in the Black Hills.	Yes	No	No – there are no proposed routes in the Cascade area. Habitat elsewhere is highly unlikely due to the lack of warm springs.
Lycopodium complanatum/ trailing clubmoss/ LYCO3	G5; SD-S1; WY-S1	*Lycopodium complanatum* is circumboreal and common across northern latitudes, but disjunct or sparse at the southern limits of the species' distribution, such as in the Black Hills. Rangewide, it is restricted to moist (not saturated) microhabitats within boreal plant communities in ravines, steep drainages, and on moist streamside benches. Nine known occurrences on BKF lands. These occurrences are located in the northern Black Hills on shaded, north-facing, white spruce dominated slopes often with paper birch (*Betula papyrifera*) or quaking aspen (*Populus tremuloides*). Black Hills occurrences range in elevation from 4,960 to 6,340 feet.	Yes	Yes	Yes
Platanthera orbiculata/ lesser roundleaved orchid/ PLOR4	G5; SD-S2; WY-S1	*Platanthera orbiculata* is endemic to the boreal regions of northern North America, with a more southern distribution in the eastern United States. Black Hills occurrences are found primarily on shady, north-facing slopes in paper birch/hardwood or white spruce forests on moist, rich, humus soil. Black Hills occurrences range in elevation from 4,350 to 6,150 feet.	Yes	Yes	Yes

Salix candida/ sage willow/ SACA4	G5; SD-S1; WY-S2	*Salix candida* is an obligate wetland species known to occur from eastern Canada to Alaska and across the northern United States. In the Black Hills it is limited to one verified extant occurrence west of Deerfield (McIntosh Fen, 6,000 feet). There is also a historical collection for the general area "from Loring Siding to Minnekahta" (unknown if the historical collection is from private or Forest Service land). Habitat includes cold seep or spring-fed saturated substrates produced by unusual hydrologic conditions where sedimentary layers of the Limestone Plateau intersect impermeable schist or shale of the crystalline Central Core. Community type associated with the occurrence is wet meadow/fen.	Yes	Yes	Yes
Salix serissima/ autumn willow/ SASE2	G4; SD-S1; WY-S1	*Salix serissima* occurs primarily in northern boreal bogs throughout its range and is a disjunct relic in the Black Hills. Four known occurrences on BKF lands in fens and wet meadows often dominated by *Carex* spp. and other *Salix* spp. Known from McIntosh Fen, Middle Fork of Boxelder Creek, Nahant and Silver Creek. Appears to occur in the same unique hydrologic conditions as *Salix candida*. Black Hills occurrences range in elevation from 5,620 to 6,000 feet.	Yes	Yes	Yes
Sanguinaria canadensis/ bloodroot/ SACA13	G5; SD-S4; WY-N/A	*Sanguinaria canadensis* occurs in moist forests from Nova Scotia south to Florida and west to Manitoba and Kansas. In the Black Hills it occupies floodplains, forested terraces, drainage bottoms, and north-facing footslopes in open, rich hardwood plant communities. The currently known range in the Black Hills is limited to the northeast portion of the Black Hills, from the east side of Spearfish Canyon to west of Tilford. Black Hills occurrences range in elevation from 3,940 to 5,000 feet.	Yes	Yes	Yes
Viburnum opulus var. *americanum*/ highbush cranberry/ VIOPA2	G5T5; SD-SNR/SU; WY-S2	*Viburnum opulus* var. *americanum* is widely distributed across north central North America. In the Black Hills it occurs at mid-elevations in wet, shaded habitats along streams, springs and canyon bottoms. The large majority of documented Black Hills occurrences are in drainage bottoms or low slopes with moist soil conditions with partial shading. Currently known sites are primarily associated with paper birch/ironwood (*Ostrya virginiana*) and paper birch/hazelnut (*Corylus cornuta*) communities, with or without white spruce or quaking aspen. A few sites are in ponderosa pine/oak (*Pinus ponderosa*/*Quercus macrocarpa*). Paper birch is present at almost all currently known sites. Black Hills occurrences range in elevation from 3,800 to 5,700 feet.	Yes	Yes	Yes

Viola selkirkii/ great-spurred violet/ VISE2	G5?; SD-S1; WY-N/A	*Viola selkirkii* is a circumboreal herbaceous species, and rangewide it is locally abundant in specialized microsites in coniferous and deciduous forests. Thirteen known occurrences on BKF lands with additional occurrences documented from Custer State Park and Mt. Rushmore National Monument. Black Hills occurrences are restricted to a concentrated area (about 36 square miles) of the central core on igneous or metamorphic bedrock. Microhabitats are often moist, cold air drainages, in shaded to open areas, and often in the vicinity of granitic rock outcrops. White spruce is usually the dominant overstory with a variable understory. All currently known occurrences on Forest Service lands are located within the Black Elk Wilderness and/or the Norbeck Wildlife Preserve. Black Hills occurrences range in elevation from 5,240 to 7,000 feet.	Yes	Yes	Yes

Note:
Codes are from the PLANTS Database at http://plants.usda.gov/
Rank is from Natureserve at http://www.natureserve.org
Distribution and Habitat is from the following sources:

USDA Forest Service. 2008. Black Hills National Forest Plant Database. Unpublished Database. Updated April 2008.

USDA Forest Service. 2005. Phase II Amendment and Final Environmental Impact Statement for the 1997 Land and Resource Management Plan. Black Hills National Forest. Custer, South Dakota. Available on-line at http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml

Appendix I: Map Packet

-- Please see separate packet of maps of DEIS Alternatives A through E --

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