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Divide Travel Plan

Draft Environmental Impact Statement

Helena Ranger District
Helena National Forest
Lewis & Clark County Montana,
Powell County, Montana

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DIVIDE TRAVEL PLAN

Draft Environmental Impact Statement
Lewis and Clark and Powell Counties, Montana

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Abstract:

The Helena National Forest is proposing changes to the existing motorized public access routes and prohibitions for wheeled and over-snow motorized vehicles on National Forest system lands within the Divide Travel Planning Area on the Helena Ranger District. The overall objective of this proposal is to provide a manageable system of designated public motorized access routes, consistent with and to achieve the purposes of, Forest Service travel management regulations at 36 CFR part 212 subpart B.

This draft environmental impact statement (DEIS) considers four alternatives in detail – the No Action and three action alternatives. Alternative 1 is the No Action alternative, which provides a baseline for comparing the magnitude of environmental effects of the action alternatives. Alternative 2 was the proposed action presented to the public during the 2008 scoping period. This alternative was developed using the current Forest Transportation System maps, information from the 2004 Helena Roads Analysis, field verification, and public input. Alternative 3 was developed in response to public input regarding wildlife security issues, non-motorized uses, and general resource concerns relative to erosion and sedimentation from road conditions. Alternative 4 was developed as a result of public comments. This alternative addresses both social and resource concerns identified by the public.

The No Action alternative would defer implementation of the Travel Management Rule, and would not result in a Motor Vehicle Use Map (MVUM). No changes would be made to the existing system of available public motorized routes and areas within the Divide Travel planning area.

The three action alternatives would be consistent with the travel planning regulations at 36 CFR 212 Subpart B, with the resulting available wheeled motorized access routes and areas designated on a MVUM and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13. If an action alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001). It would also require a programmatic plan amendment to the Helena National Forest Plan for Standard 4a, big game security. This amendment would establish a new standard for elk security for those herd units within the planning area.

SUMMARY

Introduction

The Helena National Forest (HNF) is proposing changes to the existing system of designated motorized public access routes and prohibitions within the Divide travel planning area for wheeled and over-snow motorized vehicles. The existing system of available public motor vehicle routes and areas in the Divide area is the culmination of multiple agency decisions over recent decades. Public motor vehicle use of much of this available system continues to be manageable and consistent with the current travel management regulation. Exceptions have been identified, based on public input and the criteria listed at 36 CFR 212.55, and in these cases changes are proposed. The overall objective is to provide a manageable system of designated public motorized access routes and areas within the Divide area, consistent with and to achieve the purposes of Forest Service travel management regulations at 36 CFR part 212 subpart B.

The Draft Environmental Impact Statement (DEIS) describes the anticipated direct, indirect, and cumulative environmental impacts that would result from the proposed changes and from the three alternatives. Alternatives to the proposed action were developed to address issues raised during scoping. The analysis complies with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations.

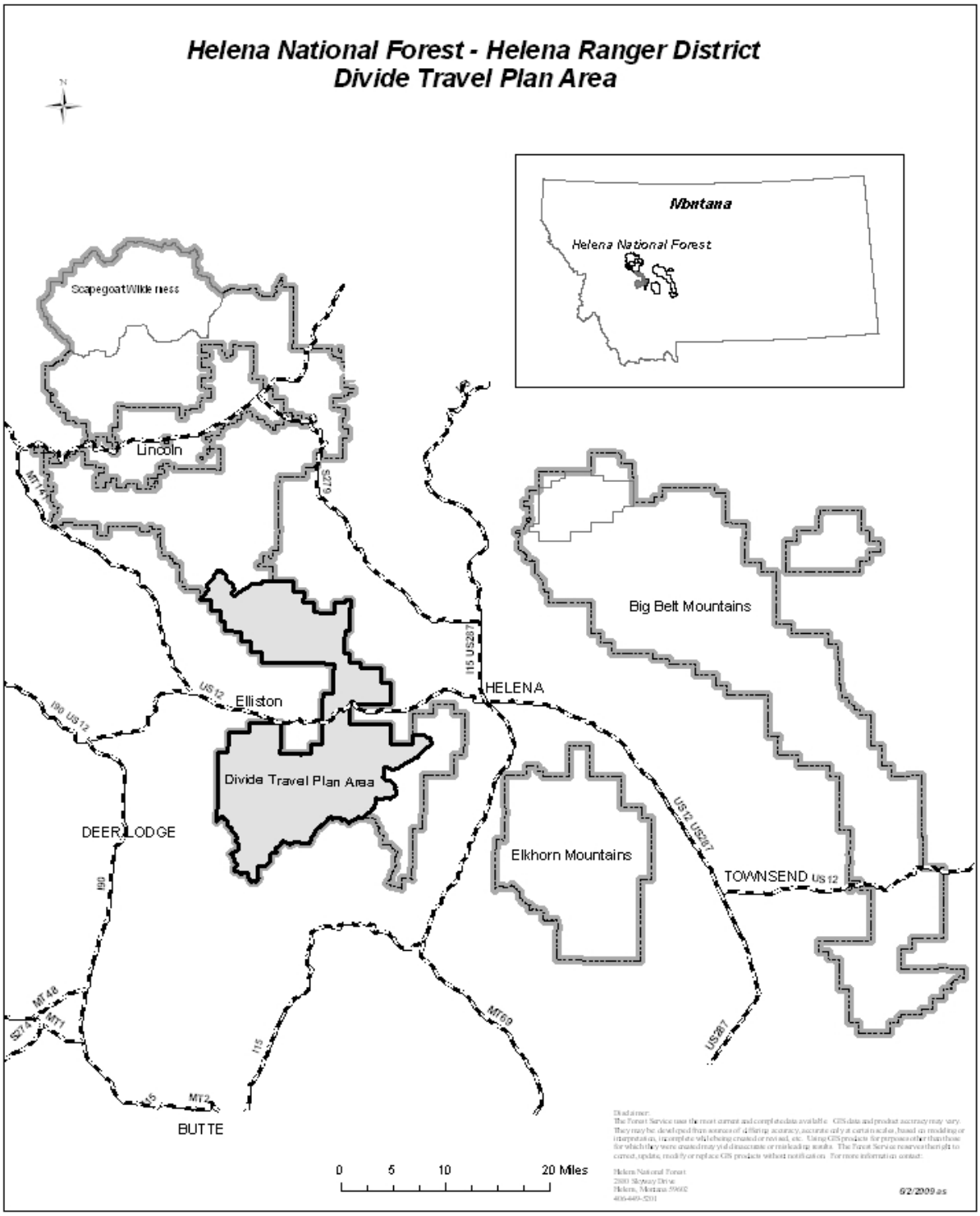
Consistent with Forest Service travel planning regulations, if implemented, the designated wheeled motorized routes within the Divide Travel Planning Area would be displayed on a Motor Vehicle Use Map (MVUM). Upon publishing the MVUM, public use of wheeled motor vehicles, other than in accordance with the designations, would be prohibited.

The area this travel plan includes is approximately 155,500 acres of National Forest System (NFS) lands and lies within Lewis and Clark and Powell Counties, located in the state of Montana. The area encompasses Black Mountain and extends to the Tenmile Drainage and Little Blackfoot and Bison Mountain Areas. The following four Inventoried Roadless Areas (IRA) are included: Electric Peak, Jericho Mountain, Lazyman, and Nevada Mountain. The HNF Plan recommended portions of the Electric Peak IRA for Congressional designation as wilderness.

The Divide Travel Plan Decision would include only open or closed determinations; decommissioning would not be specified in this decision. Any existing route not identified as a Helena National Forest (HNF) system route in this travel plan decision would be considered a non-system route and would not be considered for future motorized use. Any action resulting from this planning decision would require additional NEPA analysis. None of the alternatives would prohibit non-motorized activities. The proposed changes would determine where wheeled and over-snow motorized vehicles could access the Forest System roads and trails.

Implementing any of the action alternatives could require a programmatic plan amendment to the HNF Plan for the planning area regarding the standard for the hiding cover/open road density index. The proposed programmatic plan amendment would establish a new standard for elk security for those herd units within the planning area.

Figure 1 Location of Divide Travel Planning Area on the Helena National Forest



Divide Travel Plan History

The Divide Travel Plan was initially part of a forest-wide travel planning approach that began in 2000. In January 2001, the Forest Service and Bureau of Land Management (BLM) issued a joint decision known as the 2001 Tri-State Off-Highway Vehicle (OHV) Decision; this decision prohibited motorized cross-country wheeled-vehicle travel on all National Forest System (NFS) and BLM public lands in a three state area except on designated routes and areas. The decision amended nine Forest Plans, including the HNF Forest Plan. It also directed all National Forests to establish a schedule for completing site-specific planning that would designate appropriate uses on all system and non-system roads and trails.

In 2004, the HNF completed a Forest Roads analysis report for maintenance level 1-5 roads (see project record). The HNF used this as an additional tool for developing the road-by-road comparison table located in Appendix E of the DEIS.

In November 2005, the Forest Service published new implementing regulations (Federal Register 2005: 70 FR 68264). This rule, known as the 2005 Travel Management Rule (36 CFR Subpart B), replaced the previous regulations.

In December of 2008, the HNF mailed a newsletter summarizing the updated proposal and alternatives with a request for comments. It reiterated the change in scope of the plan from the forest-wide 2003 effort to the Divide travel planning area, provided details about the proposal, contained a public comment sheet, and furnished information on the Final Travel Management Rule of November 2005.

In September 2011, a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) was published in the Federal Register. An additional scoping period ensued, issues were identified, and alternatives developed, which then led to the development of this DEIS.

In February 2013, the HNF sent a letter to interested parties notifying them that there would be two separate decisions for this plan; one for the travel plan portion of the Environmental Impact Statement (EIS) and the other for the programmatic plan amendment. This letter also explained the objection process (36 CFR part 219) for the programmatic amendment; and the potential for the use of the 36 CFR part 218 objection process if it becomes available. Since then, the agency has received direction that any decisions that fall under 36 CFR part 212 made after September 27, 2013 would be made under 36 CFR part 218 regulations.

Regulatory Framework

Several important laws, regulations, and policies form the regulatory framework are applicable to managing the Helena National Forest. The framework is also an integral part of the purpose and need for action. These established many of the parameters for the environmental analysis of travel management for NFS lands encompassing the Divide planning area.

In addition to the following laws and documents, each specialist report in the project record identifies the regulatory framework that is applicable to their analysis.

- 2012 Planning Rule
- 2005 Motorized Travel Rule
- Forest Service Manuals (FSM) and Handbooks as applicable

- Forest Service regulations under 36 CFR part 212 subpart B and Part 261
- Forest Service regulations under 36 CFR part 218
- Forest Service regulations under 36 CFR part 219
- Executive Orders (EO) 11644, 11989, 13112
- Helena National Forest Plan (1986, as amended)
- National Forest Management Act (NFMA)
- National Environmental Policy Act (NEPA)
- Endangered Species Act (1973)
- Clean Water Act (CWA)
- National Historic Preservation Act (HNPA) of 1966, as amended
- Archaeological Resources Protection Act

Purpose of and Need for Action

The overall objective of this proposal is to provide a manageable system of designated public motorized access routes and areas within the Divide area, consistent with and to achieve the purposes of Forest Plan and travel management regulations at 36 CFR part 218 and 219.

Executive Order (EO) 11644 (1972) as amended directed the agency to, among other things, designate "the specific areas and trails on public lands on which the use of off-road vehicles may be permitted, and areas in which the use of off-road vehicles may not be permitted. The executive order, Section 8, then requires the agency to "monitor the effects of the use of off-road vehicles [and] from time to time amend or rescind designations." The Helena National Forest has updated its travel plan numerous times over the last three decades, amending or rescinding designations as monitoring indicated the need. This proposal continues that longstanding approach. Public motor vehicle use of much of the existing system continues to be manageable and consistent with EO 11644 and current travel management regulations; however, the Forest has identified a need for change in some locations.

In 2005 the Forest Service published new implementing regulations (Federal Register 2005: 70 FR 68264). This rule, known as the Travel Management Rule (36 CFR 212 Subpart B), replaced the previous regulations. While carrying forward the requirements of the executive order, it makes two other national requirements. First, all units will now use a consistent approach to wheeled motor vehicle use designations by identifying on a map those routes and areas that are open to wheeled motorized use. Second, once designations are in place, wheeled motorized travel off of designated routes and areas will be prohibited.

The purpose of this travel plan is to comply with the 2005 Travel Management Rule by providing a system of roads, trails, and areas designated for wheeled vehicle use by class of vehicle and time of year on the Helena National Forest (36 CFR 212.50). This travel plan will also designate routes and areas for over-snow motorized vehicle use.

On the Helena National Forest, complying with the Travel Management Rule means there is a need for: (1) having no motorized cross-country travel except in designated areas; (2) clarification of which trails would be open for motorized use; (3) the optional designation of 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

parking; and (4) amended forest plan direction regarding . (Projects and plans must be consistent with the forest plan, or the forest plan must be amended.)

For the Helena National Forest, wheeled motorized cross country travel has been prohibited since 2001 and therefore no change is needed for most lands to be consistent with the rule. Existing user-built or unauthorized motorized routes, however, were unaffected by the 2001 decision. At the time the 2001 Tri-State Decision was signed, approximately 16 miles of routes existed on HNF system lands within the Divide Planning area. These miles were analyzed under each alternative. Therefore, this proposal must determine future use of these routes.

To meet the overall objective, there is a need to:

- Designate public wheeled and over-snow motorized and non-motorized use for roads and trails
- Ensure the route system provides continued access for resource management needs (e.g. vegetation management and fire)
- Ensure the route system minimizes exclusive use from and to private land and mining claims
- Reduce the complexity of the current travel plan map
- Maintain inventoried roadless characteristics in the four identified inventoried Roadless Areas (IRAs)

Sideboards Used to Develop the Proposed Action

The HNF reviewed and incorporated the criteria for designation of roads, trails and areas found in 36 CFR Part 212.55 in developing the proposed action. The following sideboards were used in development of the alternatives:

- Roads and trails currently designated as open or closed were not assumed to remain designated as open or closed
- Unclassified routes (also known as user-created routes) and motorized routes would be identified on existing condition maps and determined as open to motorized use or closed to motorized use
- Type and season of use would be identified for wheeled and over-snow motorized vehicles for all system roads and trails
- Reducing the complexity of the Forest visitor use maps would be emphasized by reducing the number of different travel restriction types including seasonal restrictions; this would assist in making travel management simple and concise (i.e. current plans have 12-15 different closures); the process needs to be simplified for public understanding and management efficiency
- Coordination would continue with the Bureau of Land Management, Montana Department of Natural Resources and Conservation, and private land owners to identify access routes necessary for land management and to reduce or eliminate routes that are not necessary to meet the purpose and need for action or project objectives
- Administrative use for management needs and emergency access on closed routes would be allowed

- Any existing route not identified as a HNF system route in this travel plan would be considered a non-system route and closed to wheeled motorized vehicle use

Summary of the Proposed Action (Alternative 2)

In response to the Purpose and Need for Action, the HNF developed the proposed action using current Forest Transportation System maps, information from the 2004 Helena Roads Analysis process, field verification and monitoring, and public input received since 2000. Consistent with our travel planning regulations, the resulting available wheeled motorized access routes and areas on a MVUM would be designated and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

The proposed action (Alternative 2) includes closing some roads and trails that are currently open to motorized use; and opening some roads and trails for motorized use that are currently closed. No areas would be designated for off-route wheeled motorized use other than the limited exception for dispersed camping and parking. These proposed changes would: reduce open road densities, reduce the total miles of open roads, and reduce the miles of motorized routes in two of the four Inventoried Roadless Areas (IRAs) within the planning area (Jericho Mountain and Electric Peak). Additional details regarding the proposed action are provided in Chapter 2.

Within the Divide Planning Area, the Forest proposes, under Alternative 2, to:

- Close approximately 40 miles of roads to wheeled motorized vehicles year-long. Approximately 30 miles are currently open to highway legal vehicles year-long with no restrictions and approximately 10 miles are open for part of the year with various seasonal restrictions.
- Open approximately 106 miles of road to over-snow motorized use from 12/2 to 5/15. Approximately 64 miles of these routes are in areas where cross country over-snow use is already permissible. Approximately 42 miles of the 106 miles are currently open; however, the use period dates are different than proposed here.
- Close approximately 6.8 miles of road to over snow motorized vehicle travel.
- Place seasonal restrictions on all trails open to motorized wheeled vehicles 50’’ or less. There are no seasonal restrictions in the existing condition.
- Open approximately 4 miles of trail to wheeled motorized vehicles 50’’ or less from 5/15–10/14.
- Close approximately 8.8 miles of the Continental Divide National Scenic Trail (CDNST) to wheeled motorized use.
- Close creek/river fords until the fords can be replaced by bridges, bottomless arches or culverts in the following locations FSR #4100 across the Little Blackfoot River; FSR #495–D1 across two unnamed streams in T. 8 N., R. 6 W., Section 28 and FSR #227–D1 across the Little Blackfoot River at Larabee Gulch.
- Install signs to clarify changes to the transportation system on the ground.
- Allow wheeled motorized vehicle travel for camping within 300 feet of designated system routes, including roads and trails (unless signed otherwise) as long as: (1) No new permanent routes are created by this activity; (2) no damage to existing vegetation,

soil, or water resource occurs; (3) travel off-route does not cross streams; and (4) travel off-route does not traverse riparian or wet areas.

- Designate roads or trails to include all terminal facilities, trailheads, parking lots, and turnouts associated with the road or trail. The designation would also include parking a motor vehicle on the side of the road when it is safe to do so without causing damage to NFS resource or facilities, unless prohibited by state law, a traffic sign, or an order (36 CFR 261.54). Parking would be limited up to 30 feet from the edge of the road surface.

Public use of a motor vehicle on routes and areas not included in the above designations, including currently available unauthorized routes of approximately 7 miles, would become prohibited pursuant to 36 CFR 212.50 and 261.13 at the time the MVUM is published.

Preliminary analysis indicates this travel plan may require a programmatic amendment to the HNF plan for the planning area regarding the Forest Plan Standard 4a for the hiding cover/open road density index (HFP, p. II/17-II/18). Four of the six elk herd units in the Divide landscape are deficient in elk security at this point in time and do not meet the standard. As a result, the Forest Plan standard would be amended under a separate decision as it relates to the Divide Travel Planning Area.

Some designated seasonal closure periods are eliminated under this proposal to simplify the travel maps. Temporary closures, for spring break-up, could still be implemented as needed to limit damage to any such road, trail, or segment thereof (e.g. 36 CFR 261 - Prohibitions).

Scope of the Analysis

This travel plan analysis will serve as the site-specific analysis and is consistent with the 2005 Travel Management Rule. Exceptions to motorized use of closed roads and off-route areas not available to the public may be authorized, but not limited to, activities such as search and rescue, weed control, access to private property, permitted uses and law enforcement activities. Previous travel management decisions on the Helena Ranger District located within this planning area will not be revisited. Construction, reconstruction, additional loop opportunities, dual-use, and non-motorized uses are not part of this decision.

Decisions to be Made

The Forest Supervisor of the HNF is the responsible official for this plan. Given the purpose and need for this action, the Forest Supervisor will review the four alternatives, the anticipated effects, and public input. The Forest Supervisor will decide what changes, if any, to make to the current designated wheeled and over-snow motorized system and what, if any, Forest Plan amendments to adopt. The Forest Service has not identified a preferred alternative. All or parts of any of the alternatives, including the No Action alternative, are viable options for management of motorized travel in the planning area. Any combination of the alternatives could be selected. The responsible official will consider the comments, disclosures of environmental consequences, and applicable laws and regulations, and policies in making the decision and stating the rationale in the Record of Decision (ROD). The responsible official will also review and make a determination on the amendment to the “Helena National Forest Plan” proposed for each alternative, which is described briefly in Chapter 2, and in full in Appendix D.

With respect to the scope of the Divide analysis, the decision space is narrow. The decision centers around designating type and season of motorized use on existing roads, trails, non-system routes, and over-snow areas.

The responsible official elected to include over-snow vehicles in this analysis so that suitable areas, routes, and seasons for their operation can be provided as envisioned in the Helena Forest Plan. The 2005 Final Rule does not require that over-snow vehicles such as snowmobiles be limited to designated routes, but it does provide that they may be allowed, restricted, or prohibited.

In addition, the decision maker chose not to include construction, reconstruction, decommissioning, or obliteration in the alternatives that were analyzed in detail. The responsible official felt that potential resource impacts resulting from construction of new roads and trails, or the reconstruction of existing routes, would be better analyzed in detail at the site-specific level and documented in later analyses and decisions.

Minimization

When designating NFS trails and areas on NFS lands, the 2005 Travel Management Rule requires Forests to consider effects on the following, with the objective of minimizing:

- Damage to soil, watershed, vegetation, and other forest resources;
- Harassment of wildlife and significant disruption of wildlife habitats;
- Conflicts between motor vehicle use and existing or proposed recreational uses of
- NFS or neighboring Federal lands; and
- Conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands.

For the purposes of this planning effort, the HNF interprets the term “minimize” to mean meeting Forest Plan standards, moving forest resources toward the goals and objectives described in the Forest Plan, and complying with all state and federal regulations which would diminish the impacts of the effects on Forest resources. All of the action alternatives analyzed in the EIS would meet these requirements. Therefore, effects on Forest resources would be minimized if any of the action alternatives were selected.

Public Involvement

Since 2000, public involvement for the Divide Travel Plan process has been initiated several times. Varying circumstances have dictated the start and stop of the process since the inception in 2000 when the HNF introduced the Forest-wide approach to travel planning. The Forest-wide travel plan effort first appeared in the Federal Register as a NOI in December of 2000. It was then rescinded in March of 2003. In April, 2003 another NOI to prepare an EIS was printed in the Federal Register and then rescinded in June of 2007.

The HNF has provided opportunities for public involvement for this travel planning effort throughout this planning process. This planning effort, as currently proposed, has been posted on the quarterly Schedule of Proposed Actions (SOPA) report since April of 2008. Information gathered and received prior to the 2008 scoping helped the HNF develop the current proposed action for the area within the Divide Travel Plan.

In December of 2008, the HNF mailed a newsletter that summarized the updated proposed action alternative with a request for comments. The information was also posted on the Forest website. The proposed action reiterated the change in scope of the plan from the 2003 effort, provided details about the proposal, contained a public comment sheet, and furnished information on the Final Travel Management Rule of November 2005.

During the scoping period, the HNF hosted open houses to provide information and answer questions regarding the planning effort. The proposal was also covered in the *Helena Independent Record*. Over 300 public responses were received during the scoping period. All the letters and emails were summarized on a spreadsheet and are available for public review in the project record. A third alternative was developed in response to address some of the input received from those seeking non-motorized opportunities. The fourth alternative combines attributes from Alternatives 2 and 3, addressing both social and resource concerns.

The NOI announcing the preparation of an EIS was published in the Federal Register on Thursday September 8, 2011. This marked the continuation of the scoping comment period; during which time the Forest received comments in support of the proposed changes to routes in the Sweeny Creek Area specifically. The Forest also received requests for maps of the proposed alternatives. People who requested maps were informed of the schedule and that maps would be produced and released with the DEIS for public review and comment. People were also informed that upon release of the DEIS, a formal 60 day public comment period would be initiated and published in the Federal Register. During this time, they were encouraged to provide specific comments to assist the deciding official in understanding their concerns and/or support. Every effort was made to ensure that a comprehensive mailing list was developed to ensure the widest distribution to the public possible. The HNF also provided additional information and planning process updates on the Forest website.

In February 2013, the HNF sent a letter to the public and other agencies notifying them that there would be two separate decisions for this travel plan; one for the travel plan portion of the EIS and the other for the programmatic plan amendment. Each would utilize a separate objection process which would fall under different regulation processes. The EIS objection process is governed by 36 CFR part 218 and the amendment objection process is governed by 36 CFR 219.53(a).

The Helena District Ranger and Forest Supervisor also met with County Commissioners, tribal leaders, and individuals in addition to a variety of special user groups to discuss the alternatives and options.

Comments and Issues

Comments received from the 2008 scoping process were evaluated to determine if any issues would necessitate additional alternatives. Issues that were brought forward through the scoping process included: protection of natural resources, amount and type of motorized access, motorized use on the CDNST; motorized use in the Kading/Limburger Springs and Sweeny Creek areas, the use of motorized vehicles on routes currently closed during big game hunting season, accessibility, and unauthorized routes.

Many comments received expressed a need to enjoy the outdoors in its natural state without the interruption of motorized use. There were also those that wanted to expand motorized recreation opportunities by increasing open routes and creating loop and motorized mixed use

opportunities. Other comments received were in regard to global climate change and the carbon footprint from motorized use and others were concerned with routine travel violations.

Some commenter's disagreed with the scope or decision space for this planning effort; for example, they would like to see a decision that increases the miles available to motorized use. Others wanted to expand the scope to include construction of new routes to increase motorized loop opportunities; while others identified the need for a substantial reduction of motorized routes. Many of these comments were found to be outside the decision space for this planning effort; however, this decision does not preclude these opportunities in possible future actions.

Many route specific suggestions were evaluated in comparison to the HNFs proposed action. Some suggestions were incorporated into the appropriate alternative. Other suggestions were not incorporated due to resource concerns or because they do not meet Forest Plan objectives. Additional information can be found under the section "Alternatives Considered but not Analyzed in Detail".

Public Comments and Agency Clarifications

Several public comments discussed confusion regarding the agencies' proposal. The following paragraphs attempt to clarify specific items.

1. In regard to the HNF proposal to open additional roads to over-snow motorized travel in areas that commenters perceived as currently closed to this type of use.

The routes the HNF are proposing to open are in *areas* that are currently open to over-snow motorized travel; however, *the road prism in the open areas* is currently closed which was an oversight when the original forest plan and maps were approved and produced. The original intent was for roads to be closed to wheeled motorized use, not over-snow motorized use.

2. The action alternatives propose to open some closed roads to over-snow motorized vehicles in areas that would be open to over-snow motorized vehicles.

The majority of these roads are located north of route 136 in the Cave Gulch Area. Within Alternative 1 (existing condition), the cross-country areas are currently open to over-snow vehicles; however, the roads themselves are closed to over-snow vehicles. Alternatives 2, 3 and 4 identify these roads as open for over-snow vehicles to match the use of the surrounding area. All other motorized use would continue to be restricted from using these routes unless authorized for emergency or administrative uses.

3. Management of forest roads proposed to be closed, and for roads which are already closed to motorized use.

These routes do not automatically become incorporated into the HNF designated trail system. Therefore, these closed routes may continue to provide temporary, non-motorized access to NF lands.

4. The agency received some public comments that were not in support of the HNF analyzing unauthorized routes within the planning area.

The agency is directed to analyze any non-system or unauthorized motorized route s that existed when the 2001 Tri-State Decision was signed. This planning effort serves as the site-specific analysis meets the Decision requirements.

5. Public comments regarding the option of opening additional segments of the Continental Divide National Scenic Trail (CDNST) to motorized use was received.

The Forest is not proposing to open any additional segments to motorized use. However, there are some sections of the CDNST that are currently located on existing open roads.

Items of Interest

Kading/Limburger Springs Area

The Kading Grade was once a popular route providing motorized access from the Helena National Forest to private lands and the Beaverhead-Deerlodge National Forest. Motorized use on the Kading Grade route has declined to some extent due to the designated maintenance level for the route. In addition, National Forest lands west of Kading Grade have been closed to OHV use, with the exception of over-snow vehicles. Forest System Road 1868, Kading Grade (MTR-502) and routes 501, MTR-503, and MTR-504 are currently open to wheeled motorized vehicles from May 16th through October 14th. With the exception of the winter season, these routes are primarily used by wheeled motorized vehicles from the middle of summer through the fall hunting season.

Additionally, OHVs, which are allowed on the Kading Grade from May 16th through October 14th, also travel onto adjacent lands on the Beaverhead-Deerlodge National Forest which are closed to wheeled motorized travel.

Sweeny Creek Area

A popular area for off-highway vehicle (OHV) use is Sweeny Creek. While use is currently managed in accordance with the 2001 Tri-State OHV Decision, there are concerns regarding the amount and type of motorized use occurring in the Divide Travel Planning Area and the associated impacts.

The Sweeny Creek Area has been identified through public input (both written and verbal) as a specific area of concern. It is adjacent to both Forest boundary and a growing number of privately owned residences. As a result, Sweeny Creek is important to local residents who recreate in that location and/or may be impacted by others recreating there. For many years this area provided recreation opportunities for: hiking, picnicking, camping, folfing (Frisbee golf), group use, nature study, and hunting. During the past ten years the Sweeny Creek Area has grown increasingly popular for OHV use (ATVs and trail bikes), paint ball activities, mountain biking and horseback riding. Increased recreation use has displaced some recreationists and raised concerns with local residents regarding what they consider to be unacceptable resource and social impacts. In particular, residents have expressed frustration with the noise, dust, vandalism, litter, loss of vegetation and soil erosion that is occurring as a result of some recreation activities.

Wheeled motorized vehicles are used on constructed roads and other routes within the Sweeny Creek area. Those routes are designated as motorized trails (MTR) on Alternative Maps 1 and 2: MTR-001, MTR-004, MTR-008, MTR-011, MTR-016, MTR-017, MTR-018 and MTR-021. Other routes in the Sweeny Creek area were not carried forward in any of the alternatives as they didn't meet the definition of a route as per the 2001 Travel Decision. Twenty years ago motorized use on the Sweeny Creek routes was limited to an occasional high clearance vehicle and motorized trail bikes. With the increased popularity of OHVs, motorized use in Sweeny Creek has greatly expanded. It's a popular location for motorized use during the spring because

it is close to the town of Helena, Montana and generally snow-free earlier than many other areas on the Forest. While existing travel restrictions mandate wheeled motorized use on existing routes only, violations frequently occur and result in new unauthorized routes and resource damage. The Helena Forest Plan identified most of the Sweeny Creek area as Management Area (MA) T-1 or M-1. A management standard for MA T-1 states, "controls on motorized recreation will be implemented where necessary to protect the vegetation, soil, and water resources and to prevent road damage". Although the Sweeny Creek Area is open to over-snow vehicles, that use is limited due to the lack of a consistent snow base.

Continental Divide National Scenic Trail (CDNST)

There were concerns from the public that wheeled motorized travel was occurring on the CDNST. In the planning area there are many portions of the CDNST that are located on designated (NFSR) roads and/or county roads. There are also many places that the CDNST crosses or intersects these roads. In addition, there are sections of the CDNST that have some type of motorized use permitted.

The Continental Divide Trail (CDNST), which extends through the Divide Travel Area, is nationally designated and recognized as an important recreation destination/opportunity. Travel planning in the analysis area may provide an opportunity to make CDNST travel decisions which would move the Helena Forest toward greater compliance with national direction for the trail.

Unauthorized Routes

As stated earlier, the agency received public comments that were opposed to the HNF analyzing unauthorized routes within the planning area. However, the agency is directed to analyze all non-system or unauthorized motorized routes that were in existence when the 2001 Tri-State Decision was signed. This planning effort serves as the site-specific analysis to meet the Decision requirements.

Accessibility

We received comments from the public regarding the need for motorized opportunities during the big game hunting season that would benefit the elderly and person with disabilities.

Alternative Development Process

Collaborative efforts and discussions with forest users, landowners, agencies, local governments, recreation groups, advocacy groups, and written comments from the 2008 scoping process were used by the Interdisciplinary Team (IDT) to develop alternatives.

In December of 2008, the HNF released Alternative 2 as the proposed action for the Divide Travel Plan for public review and comments. Alternative 2 proposed changes to the existing condition that included changes in types of use, seasonal restrictions, and closures. In response to public comments, the third and fourth alternatives were developed. Alternative 3 responded to the comments received that expressed a need to enjoy the outdoors in its natural state without the interruption of motorized use. Alternative 4 combined some aspects featured in Alternative 2 and 3 in a manner to balance the interest expressed from both the motorized and non-motorized communities.

The original public comment letters and the agency's responses are filed in the project record.

Alternatives Eliminated From Detailed Study

Alternatives were proposed which focused on increasing access for multiple uses and increased motorized opportunities. These alternatives also included construction of new routes in addition to routes on private lands that are currently unavailable for public use.

In evaluating these alternatives, the HNF determined that many of the proposed motorized routes were already analyzed in Alternative 1 (No Action) or Alternative 2. Portions of these alternatives were eliminated from detailed study because they fell outside the scope of this planning effort.

There were a number of suggestions proposing opportunities for motorized access during the hunting season. There was also a proposal to open an area to motorized use from dawn until dusk. These suggestions were considered but eliminated from detailed analysis because part of the purpose and need for the planning area is the identified need to reduce the number of area closure dates.

Changes to the Maps of the Alternatives

Maps of the alternatives were completed in June 13, 2011. The maps incorporated changes identified during field work and corrections to the data brought forward by the public and the IDT. The data was frozen in June of 2011, so the effects analysis could be completed on a consistent data set and maps. The HNF continues to record corrections, and will consider these between the draft and final environmental impact statements. Change identified by staff or the public after June 13, 2011 will not be reflected on the maps of the alternatives in this DEIS.

Alternatives Considered in Detail

Four alternatives were considered in detail. Alternative 1 (No Action) represents the existing condition in the Divide Travel Plan area, which is the baseline condition, used to compare and contrast the action alternatives. Alternative 2 is referred to as the Proposed Action because it is what was initially proposed. This alternative represents a system of motorized roads and trails including winter travel use that meet the purpose and need for this plan. In addition, it reduces motorized use on the CDNST and compliments the purpose of this trail as described in this CDNST Comprehensive Plan of 1985 (p. 10). Alternative 3 reflects input received during the scoping process to increase non-motorized use and reduce resource impacts in areas such as Sweeny Creek and Kading/Limburger Springs areas. Alternative 4 also meets the purpose and need, while taking into account all the comments received. It is a combination of Alternatives 2 and 3.

A description of each route and its status by alternative is found in Appendix E of this document. The alternative descriptions in this chapter summarize the road and trail mileages by category of access for both summer and winter uses. It is important to note that route mileages listed in this chapter may slightly differ from those queried for specialist's reports. Individual resource analysis boundaries may extend beyond the established planning area boundaries.

Features Common to All Alternatives

Laws and Policies

Below are some current laws and policies which apply to all the alternatives analyzed in this analysis:

- Motorized use on National Forest System roads and trails is subject to Montana State Law.
- In accordance with 36 CFR 261.12, National Forest System roads and trails, the following is prohibited: (c) Damaging and leaving in a damaged condition any such road, trail, or segment thereof.
- In accordance with 36 CFR 261.15, use of vehicles off roads (h), it is prohibited to operate any vehicle off National Forest System, State, or county roads in a manner which damages or unreasonably disturbs the land, wildlife, or vegetative resources.
- As provided for in the Travel Management Rule, none of the alternatives preclude the forest from closing roads, trails, or areas to motorized use through emergency closure orders.

The public must continue to follow State and Federal rules and regulations as well as HNF regulations.

Types of Routes and Other Definitions

This analysis includes roads as they would be available for vehicles consistent with State laws. A mixed motorized use analysis and designation requires an engineering evaluation rather than a NEPA analysis. This will be completed as part of the implementation phase of this travel planning effort.

The following categories of routes used in this planning analysis are taken from the definitions in 36 CFR 212-Travel Management. The Forest Transportation System includes NFS roads (NFSR), NFS trails, and airfields on NFS lands. A glossary is located at the end of this document.

- Designated Road, Trail or Areas - NFS roads, NFS trails, or areas on NFS lands that are designated for public motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map.
- Mixed motorized use –NFS road for use by both highway-legal and non-highway-legal motor vehicles (FSM 7705).
- Motorized use – A term used to refer to travel by any motor vehicle (FSM 7705, FSH 2309.18.05); for purposes of this analysis, motorized use is considered use by wheeled motor vehicles (Not over-snow vehicles).
- Motorized 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.
- 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).

- Over-Snow Vehicle - A motor vehicle that is designed for use over-snow and runs on a track or tracks and/or a ski or skis. Over-snow replaces the term snowmobile. These terms may be found interchangeably throughout specialist reports.
- Road - A motor vehicle route over 50 inches wide, unless identified and managed as a trail.
- Route – A term used in this document to refer to a road or a trail.
- Trail - A route 50 inches or less in width that is identified and managed as a trail. Trails identified for motorized use are available for non-motorized use as well.
- Unauthorized Road or Trail - One that is not included in a forest transportation system. Unauthorized Road or Trail replaces old terms of non-system and unclassified route as well as user-created and undesignated. These terms may be found interchangeably throughout specialist reports.

Motorized Use within 300 Foot Buffers

The 2001 OHV decision provided for motorized uses within 300 feet of roads and trails for the purpose of dispersed camping and parking associated with dispersed camping. It required visitors to select campsites by non-motorized means and access the campsites by the most direct route causing the least damage. It also allowed for big game retrieval. The expectation was that relatively few new sites were developed within the 300 foot area, as most good camping/parking areas already have a road to them. The same is expected for the Divide Travel Planning Area as this area has a legacy of dispersed use. Many areas within 300 feet of an open route are already unsuitable for use due to terrain or vegetation limitations.

Continental Divide National Scenic Trail (CDNST)

The attached map displays the Continental Divide National Scenic Trail (CDNST) that is within the Divide Travel Planning Area. In the planning area there are portions of the CDNST that are located on designated (NFSR) roads and/or county roads. There are also places that the CDNST crosses or intersects these roads. In addition, there are sections of the CDNST that have some type of motorized use permitted. The descriptions provided in each alternative reflect these portions – identifying each road segment (with motorized activity) along the trail and the proposed designations for each segment under the action alternatives.

Features Common to All Action Alternatives

- If, through monitoring, the Forest Service finds that motor vehicle use on a route is directly causing adverse effects on public safety or on natural or cultural resources, it may be closed immediately per 36 CFR 212.52(b)(2) until the Forest Supervisor determines that such adverse effects have been mitigated or eliminated. Depending on the situation, the Forest Service could try other means of preventing or repairing damage to natural or cultural resources.
- All motorized trails designated for vehicles 50 inches wide or less (which includes motorcycles) would be permitted in all the alternatives.
- Safe parking would be allowed within 30’ from the edge of a designated motorized route for the purpose of any legal forest activity (FSM 7700).
- A portion of the Nevada Mountain IRA is located on the Lincoln Ranger District, and a portion of the Electric Peak IRA is located on the Beaverhead-Deerlodge National Forest

(B-D NF). This travel plan proposal covers only the areas of each IRA located within the Divide Travel Planning area.

- Through this decision, closure methods would be limited to signs.
- Signs would be posted to clarify changes to the transportation system on the ground when possible.
- Road closure effectiveness for resource concerns would be monitored.
- Public notification of temporary closures would be completed through news releases and signing
- The stream crossing that provides access to the Larabee Gulch Trailhead on NFSR #227-D1 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- The stream crossing that provides access to Golden Anchor on NFSR #4100 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- Two unnamed stream crossings located on NFSR #495-D1 in T8N, R6W Section 28 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- Motorized over-snow use would have seasonal restrictions.
- Groomed snowmobile routes located on Forest roads and trails would be closed to wheeled motorized vehicles during their designated period of use.
- Seasonal restrictions would be placed on all trails open to motorized wheeled vehicles 50" and less.
- Roads would be open to over-snow motorized vehicles located in areas open to over-snow motorized vehicles to match the use of the surrounding area. All other motorized use would continue to be restricted from using these routes unless authorized for emergency or administrative uses.
- Existing snowmobile routes located on Forest roads would be closed to wheeled motorized vehicles when they are groomed.

Sweeny Creek Area

One notable change in the Sweeny Creek Area under Alternatives 2, 3, and 4 is the winter closure to motorized travel. Approximately 5,700 acres in that area (including the motorized trails) would be closed to over-snow motorized travel from October 16th thru May 14th.

The existing unauthorized motorized routes located in the Sweeny Creek Area would be designated as trails open to motorized vehicles 50 inches in width or less from May 16th thru October 14th. Although that area does not receive a great deal of over-snow vehicle use at the current time, it has become popular with OHV riders both during the winter and spring. Designation of these routes as system trails would provide another area on the Helena Forest specifically available for OHV use.

Continental Divide National Scenic Trail (CDNST)

Both motorized and non-motorized uses would occur across the 56 miles of the CDNST located within the planning area.

Alternative 1, No Action

The No Action Alternative is required under NEPA regulations [40 CFR 1502.14(d)]. This alternative represents the existing, baseline condition or trends by which the action alternatives are compared.

The No Action alternative would defer implementation of the Travel Management Rule, and would not result in a Motor Vehicle Use Map (MVUM). No changes would be made to the existing system of available public motorized routes and areas within the Divide Travel planning area.

No Action is represented by the current Helena National Forest map and supporting prohibitions. Permissible motorized uses include those routes and areas not otherwise prohibited, including use of approximately 16 miles of unauthorized or user-created routes. Under No Action, motorized access for dispersed camping, parking associated with camping.

The Helena National Forest Plan, as amended, prohibits wheeled cross country travel (2001 Tri-State OHV Decision). However, wheeled motorized use of unauthorized routes that existed at that time of that Forest Plan amendment are unaffected by this prohibition. That use is not defined as cross-country travel under the amended Forest Plan as long as the vehicle fits within the pre-existing width of the route. As discussed above, the motorized access for dispersed camping is an exception and that use is also permitted up to 300 feet from these routes. Under the No Action Alternative, these uses could continue.

Design Features

Kading-Limburger Springs Area

Under this alternative, Forest Road 1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR-504 would remain open to wheeled motorized vehicles 50” in width or less from May 16th through October 14th. This motorized activity would provide opportunities for Off Highway Vehicle (OHV) enthusiasts and hunters.

Motorized access on Forest Service Road #227-D1 would continue to provide limited wheeled motorized vehicle access (with a ford across the Little Blackfoot River) to a trailhead and Miller Cabin in Larabee Gulch. Although there is no road bridge across the Little Blackfoot River, the short spur road east of the river is currently open to motorized travel.

The existing non-system motorized routes located in the Kading area would be authorized as designated motorized trails open from May 16th through October 14th. These routes would be maintained as system trails.

Sweeny Creek Area

Existing unauthorized motorized routes located in the Sweeny Creek Area would continue to be open as motorized trails with no seasonal restrictions.

Continental Divide National Scenic Trail (CDNST)

There are approximately 9 miles of the CDNST which are currently open to wheeled motorized travel. Per Forest Service Manual (FSM) 2300 direction, motorized use would only be allowed on the CDNST if the route and type of use was in existence prior to November 10, 1978. Spur road 136-D1 was identified on the 1977 Helena Forest map as a trail open to motorized vehicles

under 40 inches wide. As a result, any wheeled motorized vehicles exceeding 40" in width would not be authorized on Forest Road 136-D1.

Other motorized segments of the CDNST are roads which existed prior to November 10, 1978. In accordance with recent direction, those routes could continue to serve as segments of the CDNST if they are primitive and motorized use does not substantially interfere with the nature and purposes of the CDNST. Most of the existing motorized segments of the CDNST are located on Forest Roads #136, 495, 622, 1802, 1802-B2, and 1855. Motorized use on existing CDNST segments would continue. Approximately 19 miles of the CDNST would be closed to wheeled motorized travel. The existing single track trail segments in the vicinity of Priest Pass and Mullan Pass would remain open to motorized trail bikes. In addition, Forest Road #136–D1 would remain open to motorized use year- long.

Approximately 24.6 miles of the CDNST would continue to be open to wheeled motorized travel.

Approximately 8 miles of the CDNST would continue to be located in an area open to over-snow motorized vehicles.

Table 11 at the end of this summary identifies the type of use the trail is currently being managed for. Some segments are on designated County roads and others are on a portion of the National Forest System Roads. The segments are arranged from north to south.

Unauthorized Routes

Identified unauthorized routes are considered open within the context of this alternative. Sixteen miles are identified as unauthorized routes which are currently open to wheeled motorized use. Any unauthorized routes not identified or included in this alternative are considered closed.

Accessibility

Under the existing condition there are no special for provisions to provide motorized access opportunities during big game rifle season.

Access to Dispersed Campsites

Under the existing condition, Alternative 1, the 2001 Tri-State Decision allowed off-vehicle camping within 300 feet of roads and trails; but, required visitors to select camp sites by non-motorized means and access the campsites by the most direct route causing the least damage.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Other Features

- Seasonal closures
- Larabee Gulch Trailhead stream crossing would remain open
- Two stream crossings on NFSR #495-D1 that provide access to motorized vehicles 50" or less from May 16 through October 14 on NFSR #4104A would remain open
- Stream crossing or ford access to Golden Anchor on NFSR #4100 would remain open
- Approximately 75 miles of road located within areas open to over-snow motorized use would continue to be closed to over-snow motorized vehicles

The following table reflects the miles for each type of use for Alternative 1, the existing condition. For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Table 1 Alternative 1, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition
Roads open to highway legal vehicles, no seasonal restrictions (OPEN-HWY-LEGAL)	286
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles	85
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8
Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2 – 5/15 (03-Res)	4
Roads closed to wheeled motorized vehicles yearlong (06-Res) Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7
Trails open to vehicles 50” or less in width 5/16-10/14	7
Trails open to vehicles 50” or less in width, no seasonal restriction	12
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16
Non-motorized system trail (NO MTR)	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2
CDNST open to wheeled motorized vehicles	24.6
CDNST located in an area open to over-snow motorized vehicles	8.0
CDNST located on State or County Jurisdiction	4.4

Alternative 2, Proposed Action

Alternative 2 was the proposed action presented to the public during the 2008 scoping period. This alternative was developed using the current Forest Transportation System maps, information from the 2004 Helena Roads Analysis, field verification, and public input.

Consistent with the travel planning regulations at 36 CFR 212 Subpart B, the resulting available wheeled motorized access routes and areas would be designated on a MVUM and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

For more specific detail regarding mileage please refer to Table 2 in addition to the alternative maps at the end of the document. If this alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001).

Design Features Specific to Alternative 2

Kading/Limburger Springs Area

NFSR #1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR 504 would remain open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th.

Sweeny Creek Area

The existing unauthorized motorized routes located in the Sweeny Creek Area would be designated as trails open to motorized vehicles 50 inches in width or less from May 16th thru October 14th. Designation of these routes as system trails would provide another area on the Helena Forest specifically recognized for OHV use. Although that area does not receive a great deal of over-snow vehicle use at the current time, it has become popular with OHV riders both during the winter and spring.

One notable change in the Sweeny Creek Area under Alternatives 2 is the winter closure to motorized travel. Approximately 5,700 acres in that area (including the motorized trails) would be closed to over-snow motorized travel from October 16th thru May 14th.

Continental Divide National Scenic Trail (CDNST)

Under this alternative the majority of Forest Road #136-D1 (2 miles) would be closed to wheeled motorized vehicles year-long. The remaining 0.5 miles, which provide access to existing stock facilities and trailhead parking, would remain open to highway legal vehicles year-long.

Approximately 22.5 miles of the CDNST would be open to wheeled motorized travel.

Approximately 19.3 miles of the CDNST would be closed to wheeled motorized vehicles.

Approximately 12 miles of the CDNST would be located in an area open to over-snow motorized vehicles.

Please see Table 11 at the end of this summary for a comparison of alternatives in CDNST trail designations.

Unauthorized Routes

Alternative 2 would designate approximately 10 miles of identified unauthorized routes to be added to the Forest Transportation System. The existing unauthorized routes not identified or included in this alternative would be considered closed.

Accessibility

NFSRs #335-A1 and A2, #1856, and #314-J3 would be open from October 15th through December 1st to provide additional motorized access during big game rifle season.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Access to Dispersed Campsites

Under Alternatives 2, parking safely adjacent to a road within 30 feet from the edge of the road or motorized trail would be allowed. In addition, wheeled motorized vehicle travel for camping or parking associated with camping would be allowed within 300 feet of designated system routes, including roads and trails (unless signed otherwise or specifically closed) as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

Access to dispersed camping is identified as an acceptable use in the planning area under the 2001 Tri-State Decision and the 2005 Travel Management Rule. Agency personnel have observed that, in general, this has occurred without causing unacceptable resource damage. Where site-specific issues have occurred, emergency closures were issued for resource protection. The Forest Service has this tool available when needed; therefore, the HNF is proposing to continue this practice under this alternative.

Other Features

- There would be winter closures in Hahn Creek areas as well as lower elevation west facing slopes in Clarks Canyon north to Threemile Creek.
- Areas that remain open would have a season of December 2nd through May 15th for motorized over-snow travel.
- The stream crossing that provides access to the Larabee Gulch Trailhead on NFSR #227-D1 would be closed to motorized use until the ford could be replaced with a bridge, bottomless arch or culvert.
- Two stream crossings on NFSR #495-D1 that provide access to Motorized Vehicles 50" or less from May 16 through October 14 on NFSR #4104A would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.

The following table reflects the miles for each type of use for Alternative 2 in comparison to the No Action Alternative. The proposed changes listed in the table below include approximately 10 miles of currently unauthorized or user created routes that would be added. For additional details, refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Table 2 Alternative 2, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2
Roads open to highway legal vehicles, no seasonal restrictions (OPEN-HWY-LEGAL)	286	284
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	16
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2
Roads open to highway legal vehicles 5/16-12/1 (03-Res)	4	7
Open to over snow motorized vehicles 12/2-5/15 (03-Res)	4	7
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	10
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	112
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0
Open to over snow motorized vehicles 12/2-5/15 (06-Res)	0	112
Open designated routes to over snow motorized vehicles 12/2-5/15 (06-Res-Spc)	0	2
Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	10
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0
Trails open to vehicles 50” or less in width 5/16-10/14	7	25
Trails open to vehicles 50” or less in width, no seasonal restriction	12	1
Trails closed to motorized vehicles yearlong (MT-01-Res)	0	2
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16	10
Non-system roads, closed to motorized vehicles yearlong (NS-01-Res)	0	6
Non-motorized system trail (All Alternatives) (NO MTR)	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2	19.3
CDNST open to wheeled motorized vehicles	24.6	22.5
CDNST located in an area open to over-snow motorized vehicles	8.0	12.0
CDNST located on State or County Jurisdiction	4.4	4.4

Alternative 3

Comments received in the 2008 scoping process included comments regarding the desire to enjoy the outdoors in its natural state without the interruption of motorized use. Alternative 3 was developed in response to public comments regarding wildlife security issues, non-motorized uses, and general resource concerns relative to erosion and sedimentation from road conditions.

Consistent with the travel planning regulations at 36 CFR 212 Subpart B, the resulting available wheeled motorized access routes and areas would be designated on a MVUM and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

For more specific detail regarding Alternative 3, refer to Table 3. If this alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001).

Design Features Specific to Alternative 3

Kading-Limburger Springs Area

The Kading/Limburger Springs area would incorporate additional motorized closures. Under this alternative, NFSR #1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR 504 would be closed to wheeled motorized vehicle travel year-long; however, open to over-snow motorized vehicles from December 2nd through May 15th. This would also apply to non-system trails MTR-502, MTR-503 and MTR-504.

Current OHV travel for wheeled motorized vehicles 50" or less would be prohibited. Existing over-snow motorized travel on those routes would continue.

NFSR #227 would be closed just past the Kading Campground with NFSR #227-E1 becoming a non-motorized trail.

Sweeny Creek Area

The existing unauthorized routes located in the Sweeny Creek Area would be closed to motorized travel year-long. With exception of the Priest Pass Road, all routes in the Sweeny Creek area would be closed year-long to all motorized use including over-snow vehicles.

Similar to Alternative 2, approximately 5,700 acres in that area would be closed to over-snow motorized travel.

Continental Divide National Scenic Trail (CDNST)

Under this alternative the majority of Forest Road #136-D1 (2 miles) would be closed to wheeled motorized vehicles yearlong. The remaining 0.5 miles, which provide access to existing stock facilities, would remain open to highway legal vehicles yearlong. Approximately 0.6 additional miles of CDNST would be closed to wheeled motorized travel over Alternative 1.

Existing single track trail segments would be closed to wheeled motorized travel year-long.

The area south of Highway 12 along the Continental Divide from MacDonald Pass to Jericho Mountain would be closed to over-snow vehicles, except on designated routes.

Approximately 20.6 miles of the CDNST would be open to wheeled motorized travel.

Approximately 19.3 miles of the CDNST would be closed to wheeled motorized vehicles.

Approximately 10.1 miles of the CDNST would be located in an area open to over-snow motorized vehicles.

Please see Table 11 at the end of this summary for a comparison of alternatives in CDNST trail designations.

Unauthorized Routes

Alternative 3 would designate approximately 9 miles of identified unauthorized routes that would be added to the Forest Transportation System. The existing unauthorized routes not identified or included in this alternative would be considered closed

Accessibility

There would be no special provisions to provide motorized opportunity considerations for motorized access during the big game rifle season under this alternative.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Access to Dispersed Campsites

Under Alternatives 3, parking safely adjacent to a road within 30 feet from the edge of the road or motorized trail would be allowed. In addition, wheeled motorized vehicle travel for camping or parking associated with camping would be allowed within 300 feet of designated system routes, including roads and trails (unless signed otherwise or specifically closed) as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

Access to dispersed camping is identified as an acceptable use in the planning area under the 2001 Tri-State Decision and the 2005 Travel Management Rule. Agency personnel have observed that, in general, this has occurred without causing unacceptable resource damage. Where site-specific issues have occurred, emergency closures were issued for resource protection. The Forest Service has this tool available when needed; therefore, the HNF is proposing to continue this practice under this alternative.

Other Features

- NFSR #314 would be closed year-long to motorized wheeled vehicles past the gate in Section 7.
- NFSRs #314-J1 and J3 would also be closed year-long.
- Non-System Motorized Trails #501, #503, #502, and #1868 and NFSR #1871-002 would be closed to wheeled motorized use year-long.
- The stream crossing that provides access to the Larabee Gulch Trailhead on NFSR #227-D1 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- Two stream crossings on NFSR #495-D1 that provides access to Motorized Vehicles 50” or less on NFSR #4104A would be closed under this alternative.

The following table reflects the miles for each type of use for Alternative 3 in comparison to the No Action Alternative 1. The proposed changes listed in the table below include approximately 9 miles of currently unauthorized or user created routes that would be added. For additional details, refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Table 3 Alternative 3, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 3
Roads open to highway legal vehicles, no seasonal restrictions (OPEN-HWY-LEGAL)	286	262
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	21
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res)	4	7
Open to over snow motorized vehicles 12/2-5/15 (03-Res)	4	7
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	3
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	156
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0
Open to over snow motorized vehicles 12/2-5/15 (Alt 3) (06-Res)	0	156
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0
Trails open to vehicles 50” or less in width 5/16-10/14	7	0
Trails open to vehicles 50” or less in width, no seasonal restriction	12	0
Trails closed to motorized vehicles yearlong (MT-01-Res)	0	19
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16	9
Non-system roads, closed to motorized vehicles yearlong (NS-01-Res)	0	7
Non-motorized system trail (NO MTR) (not including CDNST segments)	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2	19.3
CDNST open to wheeled motorized vehicles	24.6	20.6
CDNST located in an area open to over-snow motorized vehicles	8.0	10.1
CDNST located on State or County Jurisdiction	4.4	4.4

Alternative 4

Alternative 4 was developed in response to public comments. This alternative addresses both social and resource concerns identified by the public.

Consistent with the travel planning regulations at 36 CFR 212 Subpart B, the resulting available wheeled motorized access routes and areas would be designated on a MVUM and public use of

a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

For specific detail regarding Alternative 4, refer to the table below. If this alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001).

Design Features Specific to Alternative 4

Kading-Limburger Springs Area

With the exception of over-snow vehicles during the winter, the unauthorized trails in the Kading area would be closed to wheeled motorized use.

Kading/Limburger Springs areas would be closed to wheeled motorized use year-long for resource and winter wildlife protection.

FSR #227 would be closed at the turn around located just past Kading Campground and FSR #227-E1 would be closed to wheeled motorized vehicles year-long.

NFSR #1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR 504 would be closed to wheeled motorized vehicle travel year-long; however, open to over-snow motorized vehicles from December 2nd through May 15th. This would also apply to non-system trails MTR-502, MTR-503 and MTR-504.

Sweeny Creek Area

Like Alternative 3, the existing unauthorized routes located in the Sweeny Creek area would be closed to motorized travel year-long for resource and winter wildlife protection. Similar to Alternatives 2 and 3, approximately 5,700 acres in that area would be closed to over-snow motorized travel. This area does not receive a great deal of over-snow vehicle use.

Continental Divide National Scenic Trail (CDNST)

Under this alternative the majority of Forest Road #136-D1 (2 miles) would be closed to wheeled motorized vehicles year-long. The remaining 0.5 miles, which provide access to existing stock facilities, would remain open to highway legal vehicles year-long. In addition Forest Road #1802 would be closed to motorized vehicles year-long.

Forest Road #1802 existed prior to November 10, 1978. Therefore, to meet agency direction for the CDNST, it "should not be closed to wheeled motorized travel".

Additional segments of the CDNST would be closed to wheeled motorized use. This includes the microwave tower road FSR#1802(please refer to the table below for specifics on each segment of the route).

Approximately 18 miles of the CDNST would be open to wheeled motorized travel.

Approximately 21.9 miles of the CDNST would be closed to wheeled motorized vehicles.

Approximately 12 miles of the CDNST would be located in an area open to over-snow motorized vehicles.

Please see Table 11 at the end of this summary for a comparison of alternatives in CDNST trail designations.

Unauthorized Routes

Alternative 4 would designate 6 miles of identified unauthorized routes that would be added to the Forest Transportation System. The existing unauthorized routes not identified or included in this alternative would be considered closed.

Accessibility

There would be no special provisions to provide motorized opportunity considerations for motorized access during the big game rifle season under this alternative.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Access to Dispersed Campsites

Alternative 4 would permit wheeled motorized vehicle travel within 300 feet of designated system routes, including roads and trails (unless signed otherwise). It would allow motorized travel in this zone for legal recreational activities, in addition to camping and parking associated with dispersed camping. Legal recreation activities include, but are not limited to, parking, camping, big game retrieval, hiking, hunting, or firewood gathering. These activities would be allowed as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

The following table reflects the miles for each type of use for Alternative 4 in comparison to the No Action Alternative 1, No Action alternative. The proposed changes listed below would include approximately 10 miles of currently unauthorized or user created routes that would be added. For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Other Features

- There would be winter closures in the Hahn Creek area as well as lower elevation west facing slopes in Clarks Canyon north to Threemile Creek.
- FSR #1802 and FSR #1802-C1 would be closed to wheeled motorized vehicles year-long.
- FSR #314 in the Spotted Dog area would be open to highway legal vehicles from 5/16 to 10/14 and closed to wheeled motorized vehicles from 10/15 to 5/15.
- Areas that remain open would have a season of December 2 through May 15 for motorized over-snow travel.

Table 4 Alternative 4, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 4
Roads open to highway legal vehicles, no seasonal restrictions (All Alternatives) (OPEN-HWY-LEGAL)	286	265
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	25
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2-5/15 (03-Res)	4	3
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	10
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	139
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0
Open to over snow motorized vehicles 12/2-5/15 (06-Res)	0	139
Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	3
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0
Trails open to vehicles 50” or less in width 5/16-10/14	7	4
Trails open to vehicles 50” or less in width, no seasonal restriction	12	0
Trails closed to motorized vehicles yearlong (MT-01-Res)	0	20
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16	10
Non-system roads, closed to motorized vehicles yearlong (NS-01-Res)	0	6
Non-motorized system trail (ATM NOMTR) (not including CDNST segments)	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2	21.9
CDNST open to wheeled motorized vehicles	24.6	18.0
CDNST located in an area open to over-snow motorized vehicles	8.0	12.0
CDNST located on State or County Jurisdiction	4.4	4.4

Proposed Forest Plan Programmatic Amendment for the Big Game Security Index

Detailed information and background for the proposed programmatic plan amendment is located in Appendix D. This section provides an overview of the proposed changes to forestwide

standard 4a. This amendment could be common to all alternatives. This would be a separate decision as per 36 CFR 219. Alternative A describes the existing condition – the current Forest Plan standard 4a. Alternative B describes the proposed amendment to the HNF plan.

Alternative A, Existing Condition

Alternative A, the No Action Alternative, is the existing Forest Plan Standard. In this case, 'no action' means no amendment to the existing Forest Plan. The analysis of effects associated with Alternative A describes the effects of the current Forest Plan standard. The exact language of the current standard is as follows:

Forestwide Standard Big Game 4(a) (HFP pp. II/17 – II/18)
Road management will be implemented to at least maintain big game habitat capability and hunting opportunity. To provide for a first week bull elk harvest that does not exceed 40 percent of the total bull harvest, roads will be managed during the general big game hunting season to maintain open road densities with the following limits.

Forest Plan Big Game Security Index		
Existing Percent Hiding Cover (1)	Existing Percent Hiding Cover (2)	Max Open Road Density mi/mi^2
56	80	2.4
49	70	1.9
42	60	1.2
35	50	0.1

(1) Forest Service definition - a timber stand which conceals 90 percent or more of a standing elk at 200 feet.
(2) MDFWP definition - a stand of coniferous trees having a crown closure of greater than 40 percent.

The existing hiding cover to open road density ratio should be determined over a large geographic area, such as a timber sale analysis area, a third order drainage, or an elk herd unit.

Big game security, according to this standard, is based on the relationship between the amount of hiding cover in an Elk Herd Unit (EHU) and the open road density during big game rifle season. Hiding cover is defined (HFP p. II-18) as either a timber stand which conceals 90% or more of a standing elk at 200 feet, which can only be measured in the field, stand by stand; or as stands of coniferous trees having a crown closure greater than 40%, which can be determined by aerial photo interpretation and satellite imagery[1]. Under the Forest Plan, either method is acceptable (USDA 1986, p. II/18). Open road densities include all motorized routes open during the big game rifle season, October 15 through December 1, and are calculated at 100% the length of all

[1] This analysis utilizes the MDFWP definition of hiding cover – i.e. stands of coniferous trees having a crown closure greater than 40%. The 40% canopy cover metric is an acceptable 'proxy' for mapping hiding cover as it is generally assumed that stands with 40% canopy cover or greater would in turn provide adequate screening cover that would hide 90% of an elk at 200 feet, the functional definition of hiding cover . This relationship of canopy cover and stand structure is based on modeling done by Lonner and Cada (1982) and others that used canopy cover to predict the relationship between hiding cover (as estimated by canopy cover), road densities, and harvest rate the first week of the general hunting season.

public roads and 25% the length of private roads. This relationship was based on research that indicated roads with less use have reduced impacts to elk (Perry and Overly 1976, Witmer and deCalesta 1985, and Rowland et al. 2000).

The big game security index is calculated for EHUs that include all lands, public and private, within the respective EHU. This means that elk security as determined by this index is also a function of road densities and timber harvest on private lands outside management control of the HNF. Elk may use habitat differently relative to hiding cover and motorized routes on private land which often has different hunting pressure levels than public land. Table 5 summarizes the current status of each EHU in the Divide Travel Plan project area relative to this index and includes reference to MDFWP's population objectives which are described in further detail in the section *Correlation between Standard 4(a) and Elk Numbers.*

Only one (Jericho) of the six EHUs in the Divide Travel Plan project area meets the big game security standard threshold (Big Game standard #4a: HFP p. II-18) under current conditions. Relative to MDFWP population objectives, four EHUs fall within HD 293 that is below MDFWP population objectives for elk numbers but above objectives for bull/cow ratio objectives (Greenhorn, Jericho, Little Prickly Pear/Ophir, and Spotted Dog/Little Blackfoot). Note that the one EHU that ***does*** meet Big Game Standard 4(a) occurs within HDs that are across the board in terms of MDFWP population objectives, which suggests that the current standard may be insensitive to elk population responses to their environment and/or factors outside of Forest management are influencing elk.

Even if all open motorized routes managed by the Forest were eliminated, three of the six EHUs (Greenhorn, Little Prickly Pear/Ophir, and Quartz Creek) would still not comply with Standard 4(a). This is due to hiding cover comprising less than 50% in those herd units. One of the EHUs (Black Mountain/Brooklyn Bridge) would require closure of 140 miles of its roads to achieve compliance.

Big game security in the Divide Travel Plan project area, as currently measured under the Forest Plan, will not improve in the foreseeable future because hiding cover will continue to decline as trees killed by the ongoing bark beetle epidemic begin to fall *en masse* over the next few years. Motorized route density management on the Helena National Forest cannot compensate for this loss of cover, so the standard as currrently written will remain largely unmet. At the same time, elk numbers and bull/cow rations in the project area vary in terms of MDFWP's objectives depending on the respective HD.

Table 5 Big Game Security – Hiding Cover Relative to Open Road Density

Elk Herd Unit (Associated Hunting District – HD)	Total Square Miles	Acres Hiding Cover[1]	Percent Hiding Cover[1]	Miles of Open Road (10/15-12/1)	Open Road Density (10/15-12/1)	Meets HFP Standard #4a	MDFWP HD Population Objectives[2]	Current Status of Population Objectives based on MDFWP Aerial Survey Data
Black Mountain/ Brooklyn Bridge (HDs 335, 343)	88	29,260	52%	166	1.9	No	*HD 335* 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Greenhorn (HDs 293, 335, 343)	88	16,871	30%	155	1.8	No	*HD293* 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Jericho (HDs 215, 293, 335, 343)	55	23,091	65%	68	1.2	Yes	*HD 215* 1000 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio above objectives
							HD293 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives

Elk Herd Unit (Associated Hunting District – HD)	Total Square Miles	Acres Hiding Cover[1]	Percent Hiding Cover[1]	Miles of Open Road (10/15-12/1)	Open Road Density (10/15-12/1)	Meets HFP Standard #4a	MDFWP HD Population Objectives[2]	Current Status of Population Objectives based on MDFWP Aerial Survey Data
Little Prickly Pear/ Ophir (HDs 293, 343)	136	40,222	46%	220	1.6	No	*HD293* 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Quart Creek (HD 335)	57	16,477	45%	62	1.1	No	*HD 335* 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
Spotted Dog/ Little Blackfoot (HDs 215, 293, 335)	129	48,306	59%	148	1.2	No	*HD 215* 1000 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio above objectives
							HD293 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio

[1] Cover as defined by MDFWP – - a stand of coniferous trees having a crown closure of greater than 40 percent
[2]See Table D.3 *Elk Management Units (EMU), Hunting Districts and Elk Herd Units (EHU) within the Divide Travel Project Area* in Appendix D for the relationship between the EHUs and MDFWP hunting districts.

Alternative B

Alternative B was designed to address best science and local knowledge. It also expanded consideration to all open motorized routes (whereas Alternative A only applies to roads as originally envisioned in the Forest Plan). Alternative B would replace the existing Forest Plan Big Game Standard 4(a). The Divide Travel Plan project area encompasses only about ¾ of the Divide landscape (portions of the Quartz, Black Mtn – Brooklyn Bridge, and Little Prickly Pear – Ophir EHUs falling into areas covered by previous travel management plans); however, the proposed amendment would apply to all portions of the herd units included in the Divide Travel Plan analysis. Under the Forest Plan amendment proposed for the Divide Travel Plan—and applicable to future projects in the Travel Plan Area—the "security area" approach would replace the "road density/hiding cover index" as the Forest Plan standard for gauging the vulnerability of elk to hunting. The amendment derives from the Hillis methodology (1991) and adopts specific guidelines for its application from *Recommendations for Big Game Habitat Management on the Custer, Gallatin,Helena, and Lewis and Clark National Forests* (MDFWP and USDA Working Group 2013). The exact language of the standard is as follows:

Standard

Implement an aggressive road management program to maintain or improve big game security. This will be accomplished in the Divide Landscape of the Helena National Forest by way of the following:

When security areas comprise more than 30% of that portion of an elk herd unit within the HNF administrative boundary, management activities shall not reduce the amount of security areas during the rifle season (approximately October 15 through December 1) to less than 30%. Where security areas comprise 30% or less of that portion of an elk herd unit within the HNF administrative boundary during the general rifle season, management activities shall not result in a further reduction.

Definition

Security Area – a block of big game habitat, 250 acres or larger, that is generally at least ½ mile from any open motorized route during the rifle big game hunting season (10/15 – 12/1).

Comparison of Amendment Alternatives

This section describes the effects of the two amendment alternatives (A and B) relative to the four Travel Plan alternatives (1-4). It discusses relative changes in the way elk security is enumerated between Alternatives A and B. Effects of the Travel Plan alternatives on other pertinent aspects of elk ecology and management are discussed in the DEIS.

Alternative A (Existing Condition)

Alternative A is the No Action Alternative, the current Forest Plan standard. Table 6 summarizes the status of each EHU in the Divide Travel Plan project area by Travel Plan alternative relative to this index (Big Game Standard #4a (USDA 1986, p. II/17 – II/18).

Table 6 Hiding cover, weighted open road density, and consistency with Forest Plan Big Game Standard 4(a), by Elk Herd Unit, under the Divide Travel Plan alternatives

Elk Herd Unit	% Hiding	Open Road Density (mi/mi²)				Complies with *Forest Plan* Big Game Standard 4(a)?			
	Cover	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Black Mountain – Brooklyn Bridge	52%	1.9	1.8	1.9	1.9	no	no	no	no
Greenhorn	30%	1.8	1.6	1.5	1.5	no	no	no	no
Jericho	65%	1.2	1.2	1.1	1.1	yes	yes	yes	yes
Little Prickly Pear—Ophir	46%	1.6	1.5	1.5	1.5	no	no	no	no
Quartz	45%	1.1	1.1	1.1	1.1	no	no	no	no
Spotted Dog – Little Blackfoot	59%	1.2	1.2	1.0	1.0	yes	yes	yes	yes

Only one of the 6 elk herd units (EHUs) in the Divide Travel Plan project area meets the hiding cover/ open road density standard (Big Game standard #4a: HFP, p. II-18) under current conditions. The EHU that meets the standard (Jericho) would continue to do so under each of the three Travel Plan action alternatives. Of the 5 herd units currently out of compliance with Standard 4(a), two would move closer to compliance under each of the action alternatives (because of lower open road densities) and two would remain unchanged.

Although open road densities decrease in most EHUs under the action alternatives as compared to existing conditions (Alternative 1), application of the existing Big Game Standard 4(a) to the Travel Plan alternatives reveals no change relative to the existing standard. These proposed reductions in hunting season road access (with consequent benefits for elk) do not result in any of the sub-standard EHUs moving into compliance with standard 4(a). This illustrates the concern that the big game security index, as currently defined in the Forest Plan, is not a particularly sensitive indicator of changing elk security conditions. These EHUs will never be able to meet the existing standard as long as available cover is below the minimum 50% threshold. No amount of road management will improve that condition. Even though all the action alternatives are expected to maintain or improve existing elk security in each EHU through reductions in road densities, this improvement cannot be reflected in the simplistic yes/no results used to report compliance with the current standard. Furthermore, Alternative A does not provide a measure on how unroaded areas are distributed within a respective herd unit. Several authors describe the importance of distribution of large unroaded areas for security (e.g. Lyon et al. 1985, pp. 7-8; Lyon and Canfield 1991, pp. 104-105; Canfield 1991, pp. 50-51; Christensen et al. 1993 p. 4, 5; McCourquodale 2013, p. 9). Road density data alone does not address distribution of 'unroaded' areas.

Even if it were possible to close all of the roads in the project area (several miles of roads are outside of the Forest Service's jurisdiction), some of the concerns identified by MDFWP in the *Montana Final Elk Management Plan* (MDFWP 2004) would not be ameliorated especially in those HDs where access to elk is a management concern.

In a word, the hiding cover/ open road density index, as now formulated, is insensitive to real

changes in elk security and it places impractical constraints on Forest management and on the ability of the public to use the Forest (even though the allowed use is not detrimental to elk security). The standard will be impossible to meet throughout most of—and possibly all of—the Divide landscape for the foreseeable future (25-50 years), not because of deficiencies in travel management, but because of natural loss of hiding cover.

Alternative B – (Proposed Alternative)

Alternative B utilizes the concept of the percentage of an area in security to enumerate the resulting elk security differences between the Travel Plan alternatives. The actual on-the-ground results regarding NFS road management and the changes in elk security are the same as under alternative A, only the method of describing those results has changed. Table 7 displays total acres and percent of elk security as calculated under this alternative. The results apply only to that portion of the EHU that is within the administrative boundary of the Helena National Forest and are based on blocks greater than or equal to 250 acres located greater than or equal to ½ mile from motorized routes that are open during the hunting season (10/15 through 12/1). The table also displays how this security is arranged on the landscape, relative to the number of security blocks established under each Travel Plan alternative.

Table 7 summarizes the current contribution of HNF lands to elk security. The methodology used to delineate the security areas is described in the Wildlife Specialist Report and includes consideration of topography, proximity to local population centers, travel corridors, and to a lesser extent cover. Although the proposed standard identifies 250 acres as the minimum patch size for security, in application only those blocks that were greater than 300 acres were considered secure.

As can be seen in Table 7, elk security areas provide a means of gauging elk security that is sensitive to changes in open motorized route configuration. This allows a more realistic assessment as to potential impacts of travel management proposals in different herd units than the current HFP Standard (the Big Game Security index), which shows no difference between any of the alternatives in terms of Forest Plan compliance. The difference between the two methods is largely a function of eliminating hiding cover as a primary determinant of elk security and focusing on the size and distribution of large habitat blocks to which vehicle access is limited. This is particularly appropriate in this case, as Travel Plan alternatives deal with changes in open road patterns and generally have no impact on hiding cover. However, Forest Plan standards remain in place that recognize the importance of elk hiding cover (i.e. Forest-wide Big Game Standards 3, 5 and several management area specific standards).

Among the three Travel Plan action alternatives, Alternatives 3 and 4 generally serve to consolidate security areas into larger contiguous blocks resulting in an increase in total overall acres of security and a larger average size of security areas as compared to the existing condition. In turn, this could affect sex and age structure of elk as ell as serve to retain more elk on public land. Improvements in elk security can reduce bull mortality and subsequently can improve bull:cow ratios (Leptich and Zager 1991, p. 129, 130).

Table 7 Elk Security during the Hunting Season (10/15 – 12/1) under Alternative B by Travel Plan Alternative

Elk Herd Unit (Total Acres within Administrative Boundary)	Alt. 1			Alt. 2			Alt. 3			Alt. 4		
	Acres of Elk Security	# of Security Blocks[1]	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)
Black Mountain – Brooklyn Bridge (35,873)	13983	2	39	13983	2	39	13983	2	39	13983	2	39
Greenhorn (21,693)	3433	4	16	7097	5	33	7419	5	34	7921	4	37
Jericho (29,363)	8753	3	30	6523	2	22	9333	3	32	9333	3	32
Little Prickly Pear - Ophir (59,310)	14204	3	24	17062	4	29	17062	4	29	17062	4	29
Quartz Creek (23,036)	7038	4	31	7038	4	31	7038	4	31	7038	4	31
Spotted Dog/ Little Blackfoot (63,561)	28800	5	45	27024	4	43	33046	3	52	31872	4	50

[1] The total number of Security Blocks reflects the actual number on the landscape. Some Security Blocks overlap EHU boundaries and are located within 2 or more EHUs

Alternative Conclusions

Implementation of Alternative B should reduce and/or eliminate elk displacement from public land prior to normal migration events. This addresses a primary management goal for MDFWP: maintaining or enhancing elk presence on NFS lands so that elk are available to the hunting public on public land. Several studies indicate that elk may find more complete security during hunting seasons by moving to private lands that restrict hunter access or prohibit hunting (Burcham et al. 1999, Proffitt et al. 2013). This response to hunting risk may result in elk herds that spend increasing amounts of time on privately owned lands and limit the ability to manage herd sizes through harvest (Haggerty and Travis 2006). Implementation of Alternative B can also lead to improvements in bull:cow ratios (Leptich and Zager, p. 129, 130). However, elk distribution can be affected through road management and establishment of security areas over time (Rowland et al. 2005 and McCorquodale 2003) in turn providing MDFWP the flexibility to achieve their population objectives.

Summary and Conclusions

One of the objectives of the Divide Travel Plan is to avoid imposing outdated management direction contained in the *Helena Forest Plan* (USDA 1986) on the road and trail system of the Divide landscape. The argument for doing so with regard to big game security standards has been made in previous sections. This section condenses those rationale into a more compact format.

The Travel Plan is designed to maintain a road and trail system that provides the public with reasonable access to the National Forest and allows the Forest Service to manage the landscape with some efficiency, while, at the same time, buffering as much of the wildlife resource as possible from problems generated by motor vehicles and disruptive human presence in general. Part of the process of balancing the need for road access with the security requirements of big game animals entails developing a system of habitat assessment and management guidance that can accurately depict the security status of elk in a given area and appropriately address any problems detected. Experience with the Forest Plan over the last couple decades has led HNF wildlife biologists to conclude that elk security standards in the Plan [particularly big game standard 4a (USDA 1986, p. II/17 – II/18)] do not accurately reflect the habitat needs of elk during the hunting season and have required road closures that restrict travel but often do not improve elk security.

In particular:

- *Forest Plan* standard #4a (the big game security index) indicates that five of the 6 EHUs in the Divide landscape are deficient in elk security to the point that they do not meet the standard.
- Despite the fact that five out of 6 EHUs do not meet Forest Plan Standard 4(a), elk numbers have been steadily increasing since the crafting of the Forest Plan in 1986. Aerial survey data collected by Montana Department Fish, Wildlife, and Parks staff through 2011 indicate that there are at least 10,727 elk within the hunting districts that comprise the Helena National Forest. This is well above the 6400 benchmark identified in the Forest Plan.

- MDFWP data indicate that elk populations in the Divide landscape are either at or near population objectives of the *Montana Final Elk Management Plan* (2004) for the last several years for most of the HDs; or that management challenges are are only partially habitat related. That is, elk security is adequate in many HDs. The existing FP standard is not an accurate indicator of elk security.
- In spite of the fact that the Travel Plan alternatives close miles of routes to vehicle access during the hunting season, big bame standard 4(a) indicates that there is no improvement in elk security in any unit.
- In several herd units, not even the closure of all roads managed by the Helena National Forest would be enough to meet standard 4(a). In 4 herd units, current hiding cover percentages require that all open roads, public and private, be closed in order to meet standard #4a. In a 4th herd unit approximately 140 miles of roads would need to be closed if the standard is to be met.. These requirements are impractical on a grand scale. And the HNF is put in the position of never being able to meet standard 4(a) in these herd units in the foreseeable future (even while elk continue to thrive).
- By introducing reasonably measurable criteria as part of the formula for guaging the level of security needed in a given herd unit, the new standard provides a more realistic means of guiding travel management on the National Forest.

In conclusion, Forest Plan big game standard 4(a) inaccurately depicts the nature of elk security in the Divide landscape, is insensitive to changing road densities, and places unnecessary and impractical constraints on travel management. Meanwhile, the more recently developed elk security area methodology provides a reasonably accurate picture of elk security across the landscape, is responsive to proposed changes in open road patterns, and correctly directs management to areas that need further attention.

Although this amendment would eliminate cover measurements as part of the determination of elk security, it would not change other elk or big game related standards relative to the analysis and maintenance of cover, notably Big Game Standards 1, 2, 3, and 5. Big Game Standards 4b thru 4h and 6 regarding road management activities are also still in effect.

Elk are a management indicator for commonly hunted species. As such, they are intended to be a bellwether of the effects of management activities on representative wildlife habitats with the objective of ensuring that viable populations of existing native and desirable non-native animal species are maintained. Current elk numbers are well above those established as benchmarks in the 1986 Forest Plan, benchmarks intended to ensure that elk remain viable and huntable on the Helena National Forest.

Comparison of Alternatives

This summary provides a comparison of the proposed changes for motorized and non-motorized use for each alternative. In addition it summarizes the differences in proposed management for each segment of the CDNST for each alternative.

Table 8 Summary of the Proposed Changes for Motorized/non-motorized Use for Each Alternative (miles)

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2	Alt. 3	Alt. 4
Roads open to highway legal vehicles, no seasonal restrictions (All Alternatives) (OPEN-HWY-LEGAL)	286	284	262	265
Private roads within planning area boundary (All Alternatives) (PVT)	99	99	99	99
State or County Road (CO)	70	70	70	70
State or County Road (STATE)	34	34	34	34
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	16	23	27
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0	0	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res)	4	7	7	3
Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2 – 5/15 (03-Res)	4	0	0	0
Open to over snow motorized vehicles 12/2-5/15 (03-Res)	0	7	7	3
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	10	3	10
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	110	154	137
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0	0	0
Open to over snow motorized vehicles 12/2-5/15 (06-Res)	0	110	154	137
Open designated routes to over snow motorized vehicles 12/2-5/15 (06-Res-Spc)	0	2	0	0
Roads open to highway legal vehicles 10/15-12/1(07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	10	0	3
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0	0	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0	0	0
Trails open to vehicles 50” or less in width, no seasonal restriction	12	1	0	0

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2	Alt. 3	Alt. 4
Trails open to vehicles 50” or less in width 5/16-10/14	7	25	0	4
Trails closed to motorized vehicles yearlong (ATM MT-01-Res)	0	2	19	20
Open non-system roads and trails (Alt 1) (UOPEN-HWY-LEGAL)	16	10	9	10
Non-system roads, closed to motorized vehicles yearlong (01-Res)	0	6	7	6
Non-motorized system trail (NO MTR) (not including CDNST segments)	20	20	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.3	19.3	19.3	18.0
CDNST open to wheeled motorized vehicles	24.6	20.6	22.5	21.9
CDNST located in an area open to over-snow motorized vehicles	8.0	12.0	10.1	12.0
CDNST located on State or County Jurisdiction	4.4	4.4	4.4	4.4

Table 9 Acres Open to Over-Snow Motorized Vehicles within Each IRA

Inventoried Roadless Area (IRA)	Total Acres of NF in Divide Planning Area	Alt.1 Existing Condition	Alt.2	Alt. 3	Alt. 4
Nevada Mountain	8,435	8435	7430	682	7430
Lazyman	11,503	0	0	0	0
Jericho Mountain	8,415	8415	4520	2418	2418
Electric Peak	27,851	9550	9550	9550	9550

Table 10 Miles Open to Wheeled Motorized Vehicles within Each Inventoried Roadless Area (IRA)

Inventoried Roadless Area (IRA)	Alt. 1 Existing Condition	Alt. 2	Alt. 3	Alt. 4
Nevada Mountain	2	0.07	0.01	0.07
Lazyman	0.08	0.08	0.08	0.08
Jericho Mountain	4.11	2.4	2.4	2.4
Electric Peak	7.2	4.93	0.08	0.49

The following table compares the segments of CDNST by mileage within the Divide Travel Planning Area with Alternative 1 being the No Action alternative in comparison to the action alternatives with the proposed designations for each segment.

Table 11 Alternative Comparisons of CDNST Segment Designations (miles)

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
337	0 to 3.623	Non-Motorized Trail (NM Trail)	3.623	3.623	3.623	3.623
136-D1	0 to 0.5	OHL	0.5	0.5	0.5	0.5
136-D1	0.5 to 2.508	OHL	2.008	0	0	0
136-D1	0.5 to 2.508	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	2.008	2.008	2.008
136	11.058 to 17.305	OHL	6.247	6.247	6.247	6.247
136	17.305 to 18.943	County Road	1.638	1.638	1.638	1.638
622	1.997 to 4.725	OHL	2.728	2.728	2.728	2.728
622	4.725 to 6.783	County Road	2.05	2.05	2.05	2.05
1855-C1	0 to 1.155	OHL	1.155	1.155	1.155	1.155
1855-B2	0 to 1.283	OHL	1.283	0	0	0
1855-B2	0 to 1.283	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	1.283	1.283	1.283
1855-B1	0.367 to 0.912	OHL	0.545	0	0	0
1855-B1	0.367 to 0.912	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	0.545	0.545	0.545
1854-A1	0 to 0.218	OHL	0.218	0.218	0.218	0.218
1854	0.593 to	OHL	0.064	0.064	0.064	0.064

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
	0.657					
337	22.064 to 23.107	NM Trail	1.043	1.043	1.043	1.043
1805-D3	0 to 0.145	OHL	0.145	0	0	0
1805-D3	0 to 0.145	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)		0.145	0.145	0.145
337	23.255 to 23.358	NM Trail	0.103	0.103	0.103	0.103
355-B2	0 to 1.8	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.8	1.8	1.8	1.8
335-B1	0 to 0.071	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0.071	0.071	0.071	0.071
1802-B2	0 to 2.041	OHL	2.041	0	0	0
1802-B2	0 to 2.041	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	2.041	2.041	2.041
1802-B1	0 to 0.046	OHL	0.046	0	0	0
1802-B1	0 to 0.046	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	0.046	0.046	0.046
1802	0 to 2.694	Roads open to highway legal vehicles 5/16-12/1 Open to over snow motorized vehicles 12/2 - 5/15 (03-RES)	2.694	2.694	0	2.694

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
1802	0 to 2.694	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	0	0	2.694	0
US 12	27.519 to 28.263	Highway	0.744	0.744	0.744	0.744
4197	0 to 0.613	Roads open to wheeled motorized vehicles 5/16-4/14 Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	0.613	0	0	0
4197	0 to 0.613	Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2 – 5/15 (03-Res)	0	0.613	0.613	0.613
337	31.316 to 34.500	NM Trail	3.184	3.184	3.184	3.184
1864	3.399 to 3.959	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	0.56	0.56	0.56	0.56
337	35.064 to 37.028	NM Trail	1.964	1.964	1.964	1.964
1856	4.108 to 5.979	Roads closed to wheeled motorized vehicles yearlong (06-Res) Open to over-snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.87	0	1.87	1.87
1856	4.108 to 5.979	Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	1.87	0	0
1836	0 to 1.274	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.274	1.274	1.274	1.274
337	40.188 to 41.019	NM Trail	0.831	0.831	0.831	0.831
495-B1	0 to 0.52	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1)	0.52	0.52	0.52	0.52

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
		Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)				
495	4.191 to 10.688	OHL	6.49	6.49	6.49	6.49
337	48.038 to 56.94	NM Trail	8.902	8.902	8.902	8.902

Unauthorized Routes

As reflected in the summary of miles of motorized uses table above:

Under the No Action alternative, permissible motorized uses include those routes and areas not otherwise prohibited, including use of approximately 16 miles of unauthorized or use created routes.

Alternative 2, the Proposed Action, would designate approximately 10 miles of identified unauthorized routes that would be added to the Forest Transportation System. Any existing unauthorized routes not identified or included in this alternative would be considered closed.

Alternative 3 would designate approximately 9 miles of identified unauthorized routes that would be added to the Forest Transportation System. Any existing unauthorized routes not identified or included in this alternative would be considered closed.

Alternative 4 would designate 10 miles of identified unauthorized routes that would be added to the Forest Transportation System. Any existing unauthorized routes not identified or included in this alternative would be considered closed.

Access to Dispersed Campsites

Under the existing condition, Alternative 1, the 2001 Tri-State Decision allowed off-vehicle camping within 300 feet of roads and motorized trails; but, required visitors to select campsites by non-motorized means and access the campsites by the most direct route causing the least damage. Parking safely adjacent to a road or motorized trail within 30 feet from the edge of the road or motorized trail is also permitted under the existing condition.

Under Alternatives 2 and 3, parking safely adjacent to a road within 30 feet from the edge of the road or motorized trail would be allowed. In addition, wheeled motorized vehicle travel for camping or parking associated with camping would be allowed within 300 feet of designated system routes, including roads and trails (unless signed otherwise or specifically closed) as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

Access to dispersed camping is identified as an acceptable use in the planning area under the 2001 Tri-State Decision and the 2005 Travel Management Rule. Agency personnel have observed that, in general, this has occurred without causing unacceptable resource damage. Where site-specific issues have occurred, emergency closures were issued for resource protection. The Forest Service has this tool available when needed; therefore, the HNF is proposing to continue this practice under Alternatives 2 and 3.

Alternative 4 would permit wheeled motorized vehicle travel within 300 feet of designated system routes, including roads and trails (unless signed otherwise). It would allow motorized travel in this zone for legal recreational activities, in addition to camping and parking associated with dispersed camping. Legal recreation activities include, but are not limited to, parking, camping, big game retrieval, hiking, hunting, or firewood gathering. These activities would be allowed as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

What Happens Next

The interdisciplinary team will read and consider the comments received on the DEIS. Based on substantive comments received, changes may be made to their analyses or alternatives may be modified as needed. For example, if a comment points out key facts—such as landownership, presence of wildlife species, mapping errors, or relevant scientific evidence not considered—that were not considered in the analysis, the team would modify its analysis. Under the NEPA, comments that "vote" for an alternative, or form letters that repeat the same comments, carry less weight than a substantive comment submitted only once.

The agency would then publish a Final Environmental Impact Statement (FEIS). Usually, the Forest Supervisor makes a decision at the same time and publishes it with the FEIS. The decision is called a Record of Decision (ROD). Publication of the ROD marks the beginning of the objection period, during which people who commented during the notice and comment period have the right to file an objection to the Forest Supervisor's decision.

The 90 day comment period will begin when a Notice of Availability (NOA) of the Draft EIS (DEIS) is published in the Federal Register. After the Federal Register notice is published, a legal notice will also be published in the Helena Independent Record newspaper and an open house will be scheduled. In addition, Forest staff will be on hand to meet with you, answer questions and discuss the plan and process.

To participate in the objection process for the programmatic plan amendment, you must submit substantive formal comments related to the programmatic amendment during the 90 day comment period on the Programmatic Plan Amendment (36 CFR 219.53(a)).

In addition to accepting comments on the programmatic plan amendment, we will also be accepting comments on the Divide Travel Plan for a 45 day comment period. Please note: the 90 day and 45 day comment periods will start at the same time and run concurrently for the first 45 days. Comments on the Divide Travel Plan should clearly state your issues and concerns with the alternatives, the adequacy of the DEIS, or both. Comments are most helpful when they are

focused and clearly articulate the reviewer's concerns and contentions. To have standing to appeal the Divide Travel Plan EIS final decision, you must submit comments within this 45 day comment period, which starts the day after the publication of the NOA of the DEIS in the Federal Register (36 CFR 215.6(a)(ii)).

Once a decision has been made, final maps would be printed and made available to the public. Consistent with our travel planning regulations, the resulting available wheeled motorized access routes and areas on a MVUM would be designated and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13. The first motor vehicle use map may not have all the roads, trails, and areas shown in the ROD on it. There are two reasons for this. First, closure of creek/river fords would remain in place until the required consultation with the US Fish and Wildlife Service (US FWS) is completed prior to installation of bridges, bottomless arches or culverts. Consultation may not be finished at the time the decision is made. If approved, additional NEPA clearances would need to be completed prior to installation. Second, the fisheries clearance may determine that some proposed routes and areas would cause adverse effects. In such cases, the route or area would be closed to vehicles and would not be shown on the map at all or until an acceptable strategy for mitigating the adverse effects was developed as required by US FWS.

It could take the Forest Service several years to complete all the necessary clearances needed to implement the decision. Until then, not all the routes and areas depicted in the ROD would be on the motor vehicle use map.

It is important to note that the motor vehicle use map will be published annually. If a road, trail, or area is not included in the first map, it may be included in subsequent maps as long as the proper environmental analysis and surveys are completed.

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CHAPTER 1 - PURPOSE OF AND NEED FOR ACTION

Introduction

The Helena National Forest (HNF) is proposing changes to the existing system of designated motorized public access routes and prohibitions within the Divide travel planning area for wheeled and over-snow motorized vehicles. The existing system of available public motor vehicle routes and areas in the Divide area is the culmination of multiple agency decisions over recent decades. Public motor vehicle use of much of this available system continues to be manageable and consistent with the current travel management regulation. Exceptions have been identified, based on public input and the criteria listed at 36 CFR 212.55, and in these cases changes are proposed. The overall objective is to provide a manageable system of designated public motorized access routes and areas within the Divide area, consistent with and to achieve the purposes of Forest Service travel management regulations at 36 CFR part 212 subpart B.

This Draft Environmental Impact Statement (DEIS) describes the anticipated direct, indirect, and cumulative environmental impacts that would result from the proposed changes and from the three alternatives. Alternatives to the proposed action were developed to address issues raised during scoping. The analysis complies with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations.

Consistent with Forest Service travel planning regulations, if implemented, the designated wheeled motorized routes within the Divide Travel Planning Area would be displayed on a Motor Vehicle Use Map (MVUM). Upon publishing the MVUM, public use of wheeled motor vehicles, other than in accordance with the designations, would be prohibited.

The area this travel plan includes is approximately 155,500 acres of National Forest System (NFS) lands and lies within Lewis and Clark and Powell Counties, located in the state of Montana. The area encompasses Black Mountain and extends to the Tenmile Drainage and Little Blackfoot and Bison Mountain Areas. The following four Inventoried Roadless Areas (IRA) are included: Electric Peak, Jericho Mountain, Lazyman, and Nevada Mountain. The HNF Plan recommended portions of the Electric Peak IRA for Congressional designation as wilderness.

Implementing any of the action alternatives could require a programmatic plan amendment to the HNF Plan for the planning area regarding the standard for the hiding cover/open road density index. The proposed programmatic plan amendment would establish a new standard for elk security for those herd units within the planning area.

Divide Travel Plan History

The Divide Travel Plan was initially part of a forest-wide travel planning approach that began in 2000. In January 2001, the Forest Service and Bureau of Land Management (BLM) issued a joint decision known as the 2001 Tri-State Off-Highway Vehicle (OHV) Decision; this decision prohibited motorized cross-country wheeled-vehicle travel on all National Forest System (NFS) and BLM public lands in a three state area except on designated routes and areas. The decision amended nine Forest Plans, including the HNF Forest Plan. It also directed all National Forests to establish a schedule for completing site-specific planning that would designate appropriate uses on all system and non-system roads and trails.

In 2004, the HNF completed a Forest Roads analysis report for maintenance level 1-5 roads (see project record). The HNF used this as an additional tool for developing the road-by-road comparison table located in Appendix E.

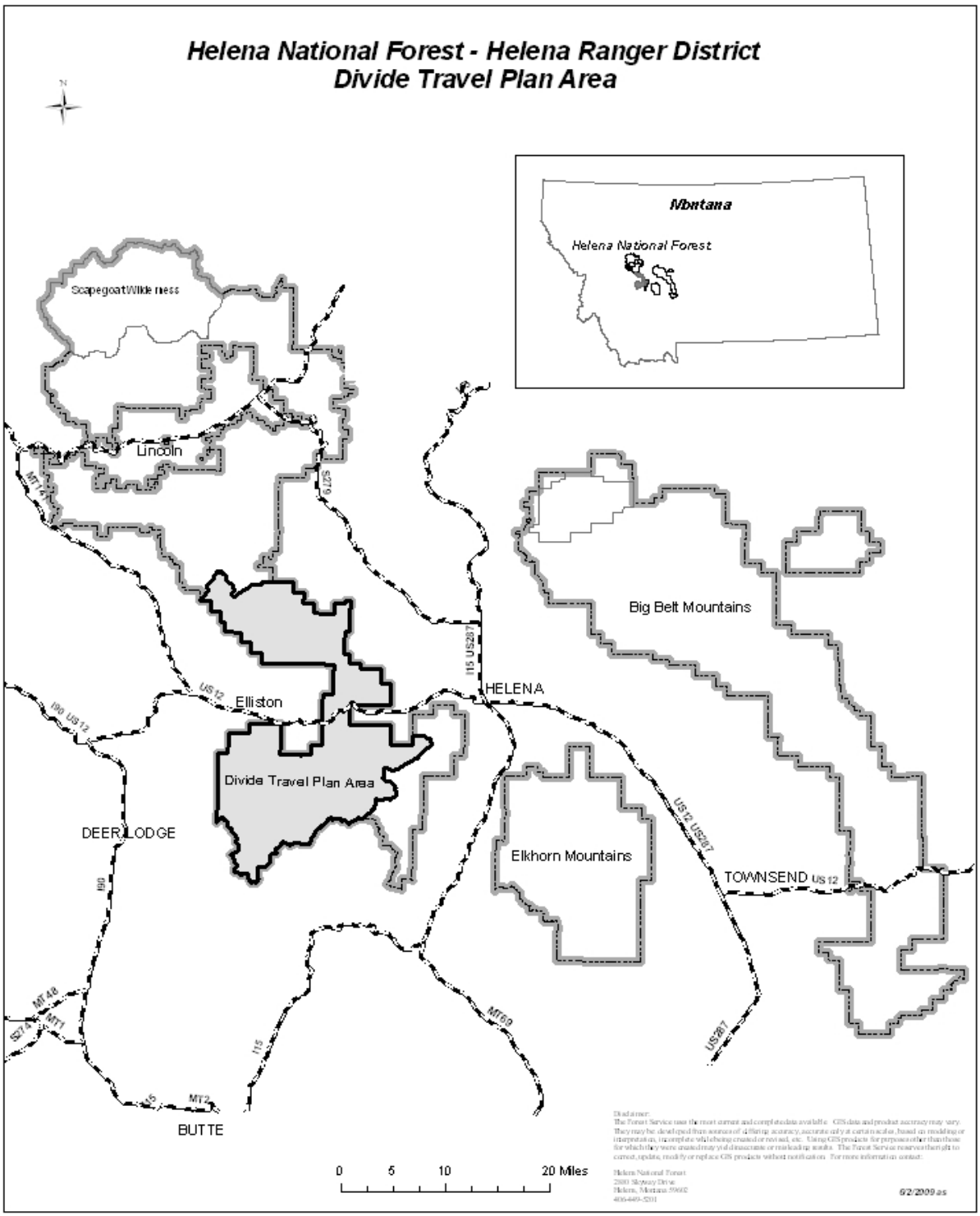
In November 2005, the Forest Service published new implementing regulations (Federal Register 2005: 70 FR 68264). This rule, known as the 2005 Travel Management Rule (36 CFR Subpart B), replaced the previous regulations.

In December of 2008, the HNF mailed a newsletter summarizing the updated proposal and alternatives with a request for comments. It reiterated the change in scope of the plan from the forest-wide 2003 effort to the Divide travel planning area, provided details about the proposal, contained a public comment sheet, and furnished information on the Final Travel Management Rule of November 2005.

In September 2011, a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) was published in the Federal Register. An additional scoping period ensued, issues were identified, and alternatives developed, which then led to the development of this DEIS.

In February 2013, the HNF sent a letter to interested parties notifying them that there would be two separate decisions for this plan; one for the travel plan portion of the Environmental Impact Statement (EIS) and the other for the programmatic plan amendment. This letter also explained the objection process (36 CFR part 219) for the programmatic amendment; and the potential for the use of the 36 CFR part 218 objection process if it becomes available. Since then, the agency has received direction that any decisions that fall under 36 CFR part 212 made after September 27, 2013 would be made under 36 CFR part 218 regulations.

Figure 1.1 Location of Divide Travel Planning Area on the Helena National Forest



Regulatory Framework

Several important laws, regulations, and policies form the regulatory framework are applicable to managing the Helena National Forest. The framework is also an integral part of the purpose and need for action. These established many of the parameters for the environmental analysis of travel management for NFS lands encompassing the Divide planning area.

In addition to the following laws and documents, each specialist report in the project record identifies the regulatory framework that is applicable to their analysis.

- 2012 Planning Rule
- 2005 Motorized Travel Rule
- Forest Service Manuals (FSM) and Handbooks as applicable
- Forest Service regulations under 36 CFR part 212 subpart B and Part 261
- Forest Service regulations under 36 CFR part 218
- Forest Service regulations under 36 CFR part 219
- Executive Orders (EO) 11644, 11989, 13112
- Helena National Forest Plan (1986, as amended)
- National Forest Management Act (NFMA)
- National Environmental Policy Act (NEPA)
- Endangered Species Act (1973)
- Clean Water Act (CWA)
- National Historic Preservation Act (HNPA) of 1966, as amended
- Archaeological Resources Protection Act

2005 Motorized Travel Rule. The 2005 Travel Rule requires National Forests to designate roads, trails and areas that are open to motor vehicle use on NFS lands. This travel rule prohibits the use of motor vehicles off designated system routes or areas. The HNF has completed the Clancy-Unionville, Elkhorns, North Belts, South Belts, and Cellar-Ogilvie (Soundwood) Travel Plans which designated motorized routes for each these areas.

The Blackfoot Non-Winter and Winter Travel Plans on the Lincoln Ranger District of the HNF are currently underway. The Travel Plan for the Divide Area will meet the subsequent site-specific planning requirements as directed in the 2005 Travel Rule. Designations for motorized use will be made per route or area; and, if appropriate, by time of year. Once these plans are complete, the HNF will have completed motorized use analysis for the entire Forest.

To address concerns about the effects of unmanaged off-highway vehicles, the Forest Service published final travel management regulations for motor vehicle use on national forests and grasslands on November 9, 2005. The Travel Management Rule recognizes the important role vehicles play in people's enjoyment of their national forests: "Motor vehicles are a legitimate and appropriate way for people to enjoy their National Forests—in the right places, and with proper management." (70 FR 26864)

The Travel Management Rule *"… 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."

Executive Orders (EO): The use of OHVs on public land stems back to the 1960s and early 1970s. This increasingly popular use prompted the development of a unified federal policy that started with 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 off-road use of motor 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. Forest Service regulations from implementing these Executive Orders are found at 36 CFR 212 subpart B and C (the Travel Rule as described above).

The Helena National Forest Plan (1986a) (FP), as amended, provides management direction for the planning area. The Forest Plan divides the Forest into management areas (MAs) – each with different goals, resource potentials, and limitations. Management areas are not single, contiguous units; they consist of many individual pieces, each classified with one of the specific management area prescriptions.

The decision for this travel plan must be consistent with the standards and guidelines in the Forest Plan. Forest-wide goals, objectives, and standards are found in Chapter II of the Forest Plan (pp. II-1 to II-36). The Plan also provides goals for each of the twelve Management Areas (MAs). Theses MAs are described in Chapter II of the Forest Plan. Each specialist report includes a section on Forest Plan consistency.

The management areas from the Forest Plan included within this planning area are: H1, H2, L1, L2, M1, P3, R1, T1, T3, T4, T5, W1, and W2. The forest-wide management direction in Chapter II of the Forest Plan applies to all management areas (Forest Plan III/1). A brief description of each management area and pertinent goals are provided in Appendix A of this document. For additional information on the MA goals, resource potentials, and limitations see the Helena Forest Plan on pages III: 5-7, 17-26, and 30-55.

The National Forest Management Act (NFMA) [16 U.S.C. 1600-1614, August 1974, as amended 1976, 1978, 1980, 1981, 1983, 1985, and 1990) reorganized, expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on National Forest lands.

NFMA 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.

Forest Service Manual (FSM) 2670 directs the Forest Service to conserve endangered and threatened species, utilize its authorities in furtherance of the Endangered Species Act, and avoid actions that would cause a species to become threatened or endangered. FSM 2670 also directs the Forest Service to maintain viable populations of native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on system lands.

National Environmental Policy Act (NEPA) (1969) [42 U.S.C. 4321 et seq.] was signed into law on January 1, 1970. The Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and it provides a process for

implementing these goals within the federal agencies. The Act also established the Council on Environmental Quality (CEQ).

Title I of NEPA contains a Declaration of National Environmental Policy which requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony. Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as Environmental Impact Statements (EISs).

The public has an important role in the NEPA process, particularly during scoping, in providing input on what issues should be addressed in an EIS and in commenting on the findings in an agency's NEPA documents. The public can participate in the NEPA process by attending NEPA-related hearings or public meetings and by submitting comments directly to the lead agency. The lead agency must take into consideration all comments received from the public and other parties on NEPA documents during the comment period.

Endangered Species Act (ESA) Forest Service Manual (FSM) 2670 directs that all federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the Endangered Species Act and to avoid actions that may cause a species to become threatened or endangered. FSM 2670 also requires the Forest Service to maintain viable populations of all native and desirable non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on system lands. As directed by the ESA, biological assessments and consultation under Section 7 of the Act will be completed for this decision.

Clean Water Act (CWA): The Federal Clean Water Act (CWA) required each state to develop its own water quality standards, subject to the approval of the Environmental Protection Agency (EPA). Section 303(d) of the CWA required each state to assess all water bodies within its borders in order to identify water quality impairments that exceeded state standards. Under the CWA, water bodies identified as impaired generally require the development of a "Total Maximum Daily Load" (TMDL—a water quality restoration plan). The state is required to systematically develop these plans in collaboration with the EPA. A water body's status on Montana's 303(d) list dictates, to a certain extent, the water quality standards under state law. Other aspects of the Clean Water Act (e.g. Section 404) do not apply to this travel plan Executive Order 12088 also requires the Forest Service to meet the requirements of the Act. Section 313 of the CWA requires Federal agencies to comply with all Federal State, interstate, and local requirements, administrative authority, and process and sanctions with respect to control and abatement of water pollution.

The National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations in 36 CFR 800, provide the legal framework for considering cultural resources in planning area. NHPA Section 106 requires that federal agencies take into account, in consultation with the State Historic Preservation Officer (SHPO), Tribes, and the Advisory Council on Historic Preservation (ACHP), the potential effects of agency actions on places and sites of archaeological or historical significance. The act establishes the National Register of Historic Places, a listing of locally, regionally and nationally significant heritage properties (36 CFR 60). In travel planning, agency historic preservation specialists use the National Register

eligibility criteria to determine the scientific, historical or cultural value of cultural resources affected by the plan.

Purpose of and Need for Action

The overall objective of this proposal is to provide a manageable system of designated public motorized access routes and areas within the Divide area, consistent with and to achieve the purposes of Forest Plan and travel management regulations at 36 CFR part 218 and 219.

Executive Order (EO) 11644 (1972) as amended directed the agency to, among other things, designate "the specific areas and trails on public lands on which the use of off-road vehicles may be permitted, and areas in which the use of off-road vehicles may not be permitted. The executive order, Section 8, then requires the agency to "monitor the effects of the use of off-road vehicles [and] from time to time amend or rescind designations." The Helena National Forest has updated its travel plan numerous times over the last three decades, amending or rescinding designations as monitoring indicated the need. This proposal continues that longstanding approach. Public motor vehicle use of much of the existing system continues to be manageable and consistent with EO 11644 and current travel management regulations; however, the Forest has identified a need for change in some locations.

In 2005 the Forest Service published new implementing regulations (Federal Register 2005: 70 FR 68264). This rule, known as the Travel Management Rule (36 CFR 212 Subpart B), replaced the previous regulations. While carrying forward the requirements of the executive order, it makes two other national requirements. First, all units will now use a consistent approach to wheeled motor vehicle use designations by identifying on a map those routes and areas that are open to wheeled motorized use. Second, once designations are in place, wheeled motorized travel off of designated routes and areas will be prohibited.

The purpose of this travel plan is to comply with the 2005 Travel Management Rule by providing a system of roads, trails, and areas designated for wheeled vehicle use by class of vehicle and time of year on the Helena National Forest (36 CFR 212.50). This travel plan will also designate routes and areas for over-snow motorized vehicle use.

On the Helena National Forest, complying with the Travel Management Rule means there is a need for: (1) having no motorized cross-country travel except in designated areas; (2) clarification of which trails would be open for motorized use; (3) the optional designation of 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 parking; and (4) amended forest plan direction regarding . (Projects and plans must be consistent with the forest plan, or the forest plan must be amended.)

For the Helena National Forest, wheeled motorized cross country travel has been prohibited since 2001 and therefore no change is needed for most lands to be consistent with the rule. Existing user-built or unauthorized motorized routes, however, were unaffected by the 2001 decision. At the time the 2001 Tri-State Decision was signed, approximately 16 miles of routes were existing on HNF lands within the Divide Planning area. These miles were analyzed under each alternative. Therefore, this proposal must determine future use of these routes.

To meet the overall objective, there is a need to:

- Designate public wheeled and over-snow motorized and non-motorized use for roads and trails
- Ensure the route system provides continued access for resource management needs (e.g. vegetation management and fire)
- Ensure the route system minimizes exclusive use from and to private land and mining claims
- Reduce the complexity of the current travel plan map
- Maintain inventoried roadless characteristics in the four identified inventoried Roadless Areas (IRAs)

Sideboards Used to Develop the Proposed Action

The HNF reviewed and incorporated the criteria for designation of roads, trails and areas found in 36 CFR Part 212.55 in developing the proposed action. The following sideboards were used in development of the alternatives:

- Roads and trails currently designated as open or closed were not assumed to remain designated as open or closed
- Unclassified routes (also known as user-created routes) and motorized routes would be identified on existing condition maps and determined as open to motorized use or closed to motorized use
- Type and season of use would be identified for wheeled and over-snow motorized vehicles for all system roads and trails
- Reducing the complexity of the Forest visitor use maps would be emphasized by reducing the number of different travel restriction types including seasonal restrictions; this would assist in making travel management simple and concise (i.e. current plans have 12-15 different closures); the process needs to be simplified for public understanding and management efficiency
- Coordination would continue with the Bureau of Land Management, Montana Department of Natural Resources and Conservation, and private land owners to identify access routes necessary for land management and to reduce or eliminate routes that are not necessary to meet the purpose and need for action or project objectives
- Administrative use for management needs and emergency access on closed routes would be allowed
- Any existing route not identified as a HNF system route in this travel plan would be considered a non-system route and closed to wheeled motorized vehicle use

Summary of the Proposed Action (Alternative 2)

In response to the Purpose and Need for Action, the HNF developed the proposed action using current Forest Transportation System maps, information from the 2004 Helena Roads Analysis process, field verification and monitoring, and public input received since 2000. Consistent with our travel planning regulations, the resulting available wheeled motorized access routes and areas on a MVUM would be designated and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

The proposed action (Alternative 2) includes closing some roads and trails that are currently open to motorized use; and opening some roads and trails for motorized use that are currently closed. No areas would be designated for off-route wheeled motorized use other than the limited exception for dispersed camping and parking. These proposed changes would: reduce open road densities, reduce the total miles of open roads, and reduce the miles of motorized routes in two of the four Inventoried Roadless Areas (IRAs) within the planning area (Jericho Mountain and Electric Peak). Additional details regarding the proposed action are provided in Chapter 2.

Within the Divide Planning Area, the Forest proposes, under Alternative 2, to:

- Close approximately 40 miles of roads to wheeled motorized vehicles year-long. Approximately 30 miles are currently open to highway legal vehicles year-long with no restrictions and approximately 10 miles are open for part of the year with various seasonal restrictions.
- Open approximately 106 miles of road to over-snow motorized use from 12/2 to 5/15. Approximately 64 miles of these routes are in areas where cross country over-snow use is already permissible. Approximately 42 miles of the 106 miles are currently open; however, the use period dates are different than proposed here.
- Close approximately 6.8 miles of road to over snow motorized vehicle travel.
- Place seasonal restrictions on all trails open to motorized wheeled vehicles 50'' or less. There are no seasonal restrictions in the existing condition.
- Open approximately 4 miles of trail to wheeled motorized vehicles 50'' or less from 5/15–10/14.
- Close approximately 8.8 miles of the Continental Divide National Scenic Trail (CDNST) to wheeled motorized use.
- Close creek/river fords until the fords can be replaced by bridges, bottomless arches or culverts in the following locations FSR #4100 across the Little Blackfoot River; FSR #495–D1 across two unnamed streams in T. 8 N., R. 6 W., Section 28 and FSR #227–D1 across the Little Blackfoot River at Larabee Gulch.
- Install signs to clarify changes to the transportation system on the ground.
- Allow wheeled motorized vehicle travel for camping within 300 feet of designated system routes, including roads and trails (unless signed otherwise) as long as: (1) No new permanent routes are created by this activity; (2) no damage to existing vegetation, soil, or water resource occurs; (3) travel off-route does not cross streams; and (4) travel off-route does not traverse riparian or wet areas.
- Designate roads or trails to include all terminal facilities, trailheads, parking lots, and turnouts associated with the road or trail. The designation would also include parking a motor vehicle on the side of the road when it is safe to do so without causing damage to NFS resource or facilities, unless prohibited by state law, a traffic sign, or an order (36 CFR 261.54). Parking would be limited up to 30 feet from the edge of the road surface.

Public use of a motor vehicle on routes and areas not included in the above designations, including currently available unauthorized routes of approximately 7 miles, would become prohibited pursuant to 36 CFR 212.50 and 261.13 at the time the MVUM is published.

Preliminary analysis indicates this travel plan may require a programmatic amendment to the

HNF plan for the planning area regarding the Forest Plan Standard 4a for the hiding cover/open road density index (HFP, p. II/17-II/18). Four of the six elk herd units in the Divide landscape are deficient in elk security at this point in time and do not meet the standard. As a result, the Forest Plan standard would be amended under a separate decision as it relates to the Divide Travel Planning Area.

Some designated seasonal closure periods are eliminated under this proposal to simplify the travel maps. Temporary closures, for spring break-up, could still be implemented as needed to limit damage to any such road, trail, or segment thereof (e.g. 36 CFR 261 - Prohibitions).

Scope of the Analysis

This travel plan analysis will serve as the site-specific analysis and is consistent with the 2005 Travel Management Rule. Exceptions to motorized use of closed roads and off-route areas not available to the public may be authorized, but not limited to, activities such as search and rescue, weed control, access to private property, permitted uses and law enforcement activities. Previous travel management decisions on the Helena Ranger District located within this planning area will not be revisited. Construction, reconstruction, additional loop opportunities, dual-use, and non-motorized uses are not part of this decision.

Decisions to be Made

The Forest Supervisor of the HNF is the responsible official for this plan. Given the purpose and need for this action, the Forest Supervisor will review the four alternatives, the anticipated effects, and public input. The Forest Supervisor will decide what changes, if any, to make to the current designated wheeled and over-snow motorized system and what, if any, Forest Plan amendments to adopt. The Forest Service has not identified a preferred alternative. All or parts of any of the alternatives, including the No Action alternative, are viable options for management of motorized travel in the planning area. Any combination of the alternatives could be selected. The responsible official will consider the comments, disclosures of environmental consequences, and applicable laws and regulations, and policies in making the decision and stating the rationale in the Record of Decision (ROD). The responsible official will also review and make a determination on the amendment to the "Helena National Forest Plan" proposed for each alternative, which is described briefly in Chapter 2, and in full in Appendix D.

With respect to the scope of the Divide analysis, the decision space is narrow. The decision centers around designating type and season of motorized use on existing roads, trails, non-system routes, and over-snow areas.

The responsible official elected to include over-snow vehicles in this analysis so that suitable areas, routes, and seasons for their operation can be provided as envisioned in the Helena Forest Plan. The 2005 Final Rule does not require that over-snow vehicles such as snowmobiles be limited to designated routes, but it does provide that they may be allowed, restricted, or prohibited.

In addition, the decision maker chose not to include construction, reconstruction, decommissioning, or obliteration in the alternatives that were analyzed in detail. The responsible official felt that potential resource impacts resulting from construction of new roads

and trails, or the reconstruction of existing routes, would be better analyzed in detail at the site-specific level and documented in later analyses and decisions.

What Happens Next

The interdisciplinary team will read and consider the comments received on this DEIS. Based on substantive comments received, changes may be made to their analyses or alternatives may be modified as needed. For example, if a comment points out key facts—such as landownership, presence of wildlife species, mapping errors, or relevant scientific evidence not considered—that were not considered in the analysis, the team would modify its analysis. Under the NEPA, comments that "vote" for an alternative, or form letters that repeat the same comments, carry less weight than a substantive comment submitted only once.

The agency would then publish a Final Environmental Impact Statement (FEIS). Usually, the Forest Supervisor makes a decision at the same time and publishes it with the FEIS. The decision is called a Record of Decision (ROD). Publication of the ROD marks the beginning of the objection period, during which people who commented during the notice and comment period have the right to file an objection to the Forest Supervisor's decision.

The 90 day comment period will begin when a Notice of Availability (NOA) of the Draft EIS (DEIS) is published in the Federal Register. After the Federal Register notice is published, a legal notice will also be published in the Helena Independent Record newspaper and an open house will be scheduled. In addition, Forest staff will be on hand to meet with you, answer questions and discuss the plan and process.

To participate in the objection process for the programmatic plan amendment, you must submit substantive formal comments related to the programmatic amendment during the 90 day comment period on the Programmatic Plan Amendment (36 CFR 219.53(a)).

In addition to accepting comments on the programmatic plan amendment, we will also be accepting comments on the Divide Travel Plan for a 45 day comment period. Please note: the 90 day and 45 day comment periods will start at the same time and run concurrently for the first 45 days. Comments on the Divide Travel Plan should clearly state your issues and concerns with the alternatives, the adequacy of the DEIS, or both. Comments are most helpful when they are focused and clearly articulate the reviewer's concerns and contentions. To have standing to appeal the Divide Travel Plan EIS final decision, you must submit comments within this 45 day comment period, which starts the day after the publication of the NOA of the DEIS in the Federal Register (36 CFR 215.6(a)(ii)).

Once a decision has been made, final maps would be printed and made available to the public. Consistent with our travel planning regulations, the resulting available wheeled motorized access routes and areas on a MVUM would be designated and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13. The first motor vehicle use map may not have all the roads, trails, and areas shown in the ROD on it. There are two reasons for this. First, closure of creek/river fords would remain in place until the required consultation with the US Fish and Wildlife Service (US FWS) is completed prior to installation of bridges, bottomless arches or culverts. Consultation may not be finished at the time the decision is made. If approved, additional NEPA clearances would need to be completed prior to installation. Second, the fisheries clearance may determine that some proposed routes and areas would cause adverse effects. In such cases, the route or area would be closed to

vehicles and would not be shown on the map at all or until an acceptable strategy for mitigating the adverse effects was developed as required by US FWS.

It could take the Forest Service several years to complete all the necessary clearances needed to implement the decision. Until then, not all the routes and areas depicted in the ROD would be on the motor vehicle use map.

It is important to note that the motor vehicle use map will be published annually. If a road, trail, or area is not included in the first map, it may be included in subsequent maps as long as the proper environmental analysis and surveys are completed.

Document Organization

This DEIS is prepared according to the format established by Council on Environmental Quality (CEQ) regulations to implement the NEPA found in 40 CFR 1500-1508. The DEIS consists of the following:

- Summary
- Chapter 1. Purpose of and Need for Action: This chapter includes a short introduction, information on the history or background leading up to the proposal, relationship to some of the pertinent laws, a statement of the purpose and need for the proposal, brief description of the agency's proposal, and the key decisions that need to be made
- Chapter 2. Alternatives, including the Proposed Action: This chapter describes the proposed action and alternatives—including no action—in detail. The HNF developed these alternatives based on significant issues raised by the public and other agencies. This chapter includes information on how the interested publics were informed along with the issues generated from the public. At the end of the chapter is a summary table of the reflecting the motorized uses proposed in each alternative in comparison to the no action alternative.
- Chapter 3. Affected Environment and Environmental Consequences: This chapter includes, by resource, a discussion of the affected environment or current situation, and the anticipated environmental consequences of the alternatives. The direct, indirect, and cumulative effects are described and how well each alternative addresses current issues related to the plan, the irreversible and irretrievable impacts, and whether actions are consistent with the Helena Forest Plan, and other laws and regulations.
- Glossary
- Literature Cited/References
- List of Preparers
- List of Agencies, Organizations, and persons to whom the DEIS is sent
- Appendices: The appendices provide more detailed information pertinent to the decisions to be made that support the analyses presented in this document. They include Appendix A Forest Plan Consistency, Appendix B Cumulative Effects, Appendix C Wildlife, Appendix D Amendment, and Appendix E Maps.

The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. For instance, they may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, and/or incomplete while

being created or revised. Due to rounding, acre totals are approximate. Using the GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification.

Project Record

This document hereby incorporates by reference the Project Record (40 CFR 1502.21). The Project Record contains specialist reports and other technical documentation and data used to support the analysis and conclusions in this document. These multiple specialist reports were developed specifically for the Divide Travel Plan project.

Relying on Specialist Reports and the Project Record helps implement the CEQ Regulations' provision that agencies should reduce NEPA paperwork (40 CFR 1500.4), that documents shall be analytic rather than encyclopedic, and the documents shall be kept concise and no longer than absolutely necessary (40 CFR 1502.2). The objective is to furnish enough site-specific information to demonstrate consideration of the environmental impacts of the alternatives, how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere, and to pursuit adequate evidence to help the responsible official determine significance. The Project Record is available at the HNF Supervisor's Office, Helena, MT.

CHAPTER 2 - ALTERNATIVES

Introduction

This chapter describes and compares the No Action alternative and three action alternatives considered by the Responsible Official for the Divide Travel Planning effort. Included in this chapter is a detailed description of the alternatives, how they were developed, and tables showing comparisons between them. There is also a section on alternatives considered but eliminated from detailed analysis. Please see alternative maps and road and trail details in Appendix E. Numbers, such as acres and miles, are approximate due to the nature of GIS data and rounding.

The Divide Travel Plan Decision would include only open or closed determinations; decommissioning would not be specified in this decision. Any existing route not identified as a Helena National Forest (HNF) system route in this travel plan decision would be considered a non-system route and would not be considered for future motorized use. Any action resulting from this planning decision would require additional NEPA analysis.

The IDT used the issues brought forward in comments received through public involvement and field verification to develop alternatives to the proposed action. Additional issues include: protection of natural resources, amount and type of motorized access, motorized use on the Continental Divide National Scenic Trail (CDNST), and the Kading/Limburger Springs and Sweeny Creek areas.

None of the alternatives would prohibit non-motorized activities. The proposed changes would determine where wheeled and over-snow motorized vehicles could access the Forest System roads and trails.

Implementing any action alternative for this Travel Plan would require a programmatic plan amendment to the Helena National Forest Plan for the planning area regarding the standard for the hiding cover/open road density index. The proposed programmatic plan amendment would establish a new standard for elk security for those herd units within the planning area.

Minimization

When designating NFS trails and areas on NFS lands, the 2005 Travel Management Rule requires Forests to consider effects on the following, with the objective of minimizing:

- Damage to soil, watershed, vegetation, and other forest resources;
- Harassment of wildlife and significant disruption of wildlife habitats;
- Conflicts between motor vehicle use and existing or proposed recreational uses of
- NFS or neighboring Federal lands; and
- Conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands.

For the purposes of this planning effort, the HNF interprets the term “minimize” to mean meeting Forest Plan standards, moving forest resources toward the goals and objectives described in the Forest Plan, and complying with all state and federal regulations which would diminish the impacts of the effects on Forest resources. All of the action alternatives analyzed in

the EIS would meet these requirements. Therefore, effects on Forest resources would be minimized if any of the action alternatives were selected.

Public Involvement

Since 2000, public involvement for the Divide Travel Plan process has been initiated several times. Varying circumstances have dictated the start and stop of the process since the inception in 2000 when the HNF introduced the Forest-wide approach to travel planning. The Forest-wide travel plan effort first appeared in the Federal Register as a NOI in December of 2000. It was then rescinded in March of 2003. In April, 2003 another NOI to prepare an EIS was printed in the Federal Register and then rescinded in June of 2007.

The HNF has provided opportunities for public involvement for this travel planning effort throughout this planning process. This planning effort, as currently proposed, has been posted on the quarterly Schedule of Proposed Actions (SOPA) report since April of 2008. Information gathered and received prior to the 2008 scoping helped the HNF develop the current proposed action for the area within the Divide Travel Plan.

In December of 2008, the HNF mailed a newsletter that summarized the updated proposed action alternative with a request for comments. The information was also posted on the Forest website. The proposed action reiterated the change in scope of the plan from the 2003 effort, provided details about the proposal, contained a public comment sheet, and furnished information on the Final Travel Management Rule of November 2005.

During the scoping period, the HNF hosted open houses to provide information and answer questions regarding the planning effort. The proposal was also covered in the *Helena Independent Record*. Over 300 public responses were received during the scoping period. All the letters and emails were summarized on a spreadsheet and are available for public review in the project record. A third alternative was developed in response to address some of the input received from those seeking non-motorized opportunities. The fourth alternative combines attributes from Alternatives 2 and 3, addressing both social and resource concerns.

The NOI announcing the preparation of an EIS was published in the Federal Register on Thursday September 8, 2011. This marked the continuation of the scoping comment period; during which time the Forest received comments in support of the proposed changes to routes in the Sweeny Creek Area specifically. The Forest also received requests for maps of the proposed alternatives. People who requested maps were informed of the schedule and that maps would be produced and released with the DEIS for public review and comment. People were also informed that upon release of the DEIS, a formal 60 day public comment period would be initiated and published in the Federal Register. During this time, they were encouraged to provide specific comments to assist the deciding official in understanding their concerns and/or support. Every effort was made to ensure that a comprehensive mailing list was developed to ensure the widest distribution to the public possible. The HNF also provided additional information and planning process updates on the Forest website.

In February 2013, the HNF sent a letter to the public and other agencies notifying them that there would be two separate decisions for this travel plan; one for the travel plan portion of the EIS and the other for the programmatic plan amendment. Each would utilize a separate objection process which would fall under different regulation processes. The EIS objection

process is governed by 36 CFR part 218 and the amendment objection process is governed by 36 CFR 219.53(a).

The Helena District Ranger and Forest Supervisor also met with County Commissioners, tribal leaders, and individuals in addition to a variety of special user groups to discuss the alternatives and options.

Comments and Issues

Comments received from the 2008 scoping process were evaluated to determine if any issues would necessitate additional alternatives. Issues that were brought forward through the scoping process included: protection of natural resources, amount and type of motorized access, motorized use on the CDNST; motorized use in the Kading/Limburger Springs and Sweeny Creek areas, the use of motorized vehicles on routes currently closed during big game hunting season, accessibility, and unauthorized routes.

Many comments received expressed a need to enjoy the outdoors in its natural state without the interruption of motorized use. There were also those that wanted to expand motorized recreation opportunities by increasing open routes and creating loop and motorized mixed use opportunities. Other comments received were in regard to global climate change and the carbon footprint from motorized use and others were concerned with routine travel violations.

Some commenter's disagreed with the scope or decision space for this planning effort; for example, they would like to see a decision that increases the miles available to motorized use. Others wanted to expand the scope to include construction of new routes to increase motorized loop opportunities; while others identified the need for a substantial reduction of motorized routes. Many of these comments were found to be outside the decision space for this planning effort; however, this decision does not preclude these opportunities in possible future actions.

Many route specific suggestions were evaluated in comparison to the HNFs proposed action. Some suggestions were incorporated into the appropriate alternative. Other suggestions were not incorporated due to resource concerns or because they do not meet Forest Plan objectives. Additional information can be found under the section "Alternatives Considered but not Analyzed in Detail".

Public Comments and Agency Clarifications

Several public comments discussed confusion regarding the agencies' proposal. The following paragraphs attempt to clarify specific items.

1. In regard to the HNF proposal to open additional roads to over-snow motorized travel in areas that commenters perceived as currently closed to this type of use.

The routes the HNF are proposing to open are in *areas* that are currently open to over-snow motorized travel; however, *the road prism in the open areas* is currently closed which was an oversight when the original forest plan and maps were approved and produced. The original intent was for roads to be closed to wheeled motorized use, not over-snow motorized use.

2. The action alternatives propose to open some closed roads to over-snow motorized vehicles in areas that would be open to over-snow motorized vehicles.

The majority of these roads are located north of route 136 in the Cave Gulch Area. Within Alternative 1 (existing condition), the cross-country areas are currently open to over-snow vehicles; however, the roads themselves are closed to over-snow vehicles. Alternatives 2, 3 and

4 identify these roads as open for over-snow vehicles to match the use of the surrounding area. All other motorized use would continue to be restricted from using these routes unless authorized for emergency or administrative uses.

3. Management of forest roads proposed to be closed, and for roads which are already closed to motorized use.

These routes do not automatically become incorporated into the HNF designated trail system. Therefore, these closed routes may continue to provide temporary, non-motorized access to NF lands.

4. The agency received some public comments that were not in support of the HNF analyzing unauthorized routes within the planning area.

The agency is directed to analyze any non-system or unauthorized motorized route s that existed when the 2001 Tri-State Decision was signed. This planning effort serves as the site-specific analysis meets the Decision requirements.

5. Public comments regarding the option of opening additional segments of the Continental Divide National Scenic Trail (CDNST) to motorized use was received.

The Forest is not proposing to open any additional segments to motorized use. However, there are some sections of the CDNST that are currently located on existing open roads.

Items of Interest

Kading/Limburger Springs Area

The Kading Grade was once a popular route providing motorized access from the Helena National Forest to private lands and the Beaverhead-Deerlodge National Forest. Motorized use on the Kading Grade route has declined to some extent due to the designated maintenance level for the route. In addition, National Forest lands west of Kading Grade have been closed to OHV use, with the exception of over-snow vehicles. Forest System Road 1868, Kading Grade (MTR-502) and routes 501, MTR-503, and MTR-504 are currently open to wheeled motorized vehicles from May 16th through October 14th. With the exception of the winter season, these routes are primarily used by wheeled motorized vehicles from the middle of summer through the fall hunting season.

Additionally, OHVs, which are allowed on the Kading Grade from May 16th through October 14th, also travel onto adjacent lands on the Beaverhead-Deerlodge National Forest which are closed to wheeled motorized travel.

Sweeny Creek Area

A popular area for off-highway vehicle (OHV) use is Sweeny Creek. While use is currently managed in accordance with the 2001 Tri-State OHV Decision, there are concerns regarding the amount and type of motorized use occurring in the Divide Travel Planning Area and the associated impacts.

The Sweeny Creek Area has been identified through public input (both written and verbal) as a specific area of concern. It is adjacent to both Forest boundary and a growing number of privately owned residences. As a result, Sweeny Creek is important to local residents who recreate in that location and/or may be impacted by others recreating there. For many years this area provided recreation opportunities for: hiking, picnicking, camping, folfing (Frisbee golf),

group use, nature study, and hunting. During the past ten years the Sweeny Creek Area has grown increasingly popular for OHV use (ATVs and trail bikes), paint ball activities, mountain biking and horseback riding. Increased recreation use has displaced some recreationists and raised concerns with local residents regarding what they consider to be unacceptable resource and social impacts. In particular, residents have expressed frustration with the noise, dust, vandalism, litter, loss of vegetation and soil erosion that is occurring as a result of some recreation activities.

Wheeled motorized vehicles are used on constructed roads and other routes within the Sweeny Creek area. Those routes are designated as motorized trails (MTR) on Alternative Maps 1 and 2: MTR-001, MTR-004, MTR-008, MTR-011, MTR-016, MTR-017, MTR-018 and MTR-021. Other routes in the Sweeny Creek area were not carried forward in any of the alternatives as they didn't meet the definition of a route as per the 2001 Travel Decision. Twenty years ago motorized use on the Sweeny Creek routes was limited to an occasional high clearance vehicle and motorized trail bikes. With the increased popularity of OHVs, motorized use in Sweeny Creek has greatly expanded. It's a popular location for motorized use during the spring because it is close to the town of Helena, Montana and generally snow-free earlier than many other areas on the Forest. While existing travel restrictions mandate wheeled motorized use on existing routes only, violations frequently occur and result in new unauthorized routes and resource damage. The Helena Forest Plan identified most of the Sweeny Creek area as Management Area (MA) T-1 or M-1. A management standard for MA T-1 states, "controls on motorized recreation will be implemented where necessary to protect the vegetation, soil, and water resources and to prevent road damage". Although the Sweeny Creek Area is open to over-snow vehicles, that use is limited due to the lack of a consistent snow base.

Continental Divide National Scenic Trail (CDNST)

There were concerns from the public that wheeled motorized travel was occurring on the CDNST. In the planning area there are many portions of the CDNST that are located on designated (NFSR) roads and/or county roads. There are also many places that the CDNST crosses or intersects these roads. In addition, there are sections of the CDNST that have some type of motorized use permitted.

The Continental Divide Trail (CDNST), which extends through the Divide Travel Area, is nationally designated and recognized as an important recreation destination/opportunity. Travel planning in the analysis area may provide an opportunity to make CDNST travel decisions which would move the Helena Forest toward greater compliance with national direction for the trail.

Unauthorized Routes

As stated earlier, the agency received public comments that were opposed to the HNF analyzing unauthorized routes within the planning area. However, the agency is directed to analyze all non-system or unauthorized motorized routes that were in existence when the 2001 Tri-State Decision was signed. This planning effort serves as the site-specific analysis to meet the Decision requirements.

Accessibility

We received comments from the public regarding the need for motorized opportunities during the big game hunting season that would benefit the elderly and person with disabilities.

Alternative Development Process

Collaborative efforts and discussions with forest users, landowners, agencies, local governments, recreation groups, advocacy groups, and written comments from the 2008 scoping process were used by the Interdisciplinary Team (IDT) to develop alternatives.

In December of 2008, the HNF released Alternative 2 as the proposed action for the Divide Travel Plan for public review and comments. Alternative 2 proposed changes to the existing condition that included changes in types of use, seasonal restrictions, and closures. In response to public comments, the third and fourth alternatives were developed. Alternative 3 responded to the comments received that expressed a need to enjoy the outdoors in its natural state without the interruption of motorized use. Alternative 4 combined some aspects featured in Alternative 2 and 3 in a manner to balance the interest expressed from both the motorized and non-motorized communities.

The original public comment letters and the agency's responses are filed in the project record.

Alternatives Eliminated From Detailed Study

Alternatives were proposed which focused on increasing access for multiple uses and increased motorized opportunities. These alternatives also included construction of new routes in addition to routes on private lands that are currently unavailable for public use.

In evaluating these alternatives, the HNF determined that many of the proposed motorized routes were already analyzed in Alternative 1 (No Action) or Alternative 2. Portions of these alternatives were eliminated from detailed study because they fell outside the scope of this planning effort.

There were a number of suggestions proposing opportunities for motorized access during the hunting season. There was also a proposal to open an area to motorized use from dawn until dusk. These suggestions were considered but eliminated from detailed analysis because part of the purpose and need for the planning area is the identified need to reduce the number of area closure dates.

Changes to the Maps of the Alternatives

Maps of the alternatives were completed in June 13, 2011. The maps incorporated changes identified during field work and corrections to the data brought forward by the public and the IDT. The data was frozen in June of 2011, so the effects analysis could be completed on a consistent data set and maps. The HNF continues to record corrections, and will consider these between the draft and final environmental impact statements. Change identified by staff or the public after June 13, 2011 will not be reflected on the maps of the alternatives in this DEIS.

Alternatives Considered in Detail

Four alternatives were considered in detail. Alternative 1 (No Action) represents the existing condition in the Divide Travel Plan area, which is the baseline condition, used to compare and contrast the action alternatives. Alternative 2 is referred to as the Proposed Action because it is what was initially proposed. This alternative represents a system of motorized roads and trails including winter travel use that meet the purpose and need for this plan. In addition, it reduces motorized use on the CDNST and compliments the purpose of this trail as described in this

CDNST Comprehensive Plan of 1985 (p. 10). Alternative 3 reflects input received during the scoping process to increase non-motorized use and reduce resource impacts in areas such as Sweeny Creek and Kading/Limburger Springs areas. Alternative 4 also meets the purpose and need, while taking into account all the comments received. It is a combination of Alternatives 2 and 3.

A description of each route and its status by alternative is found in Appendix E of this document. The alternative descriptions in this chapter summarize the road and trail mileages by category of access for both summer and winter uses. It is important to note that route mileages listed in this chapter may slightly differ from those queried for specialist's reports. Individual resource analysis boundaries may extend beyond the established planning area boundaries.

Features Common to All Alternatives

Laws and Policies

Below are some current laws and policies which apply to all the alternatives analyzed in this analysis:

- Motorized use on National Forest System roads and trails is subject to Montana State Law.
- In accordance with 36 CFR 261.12, National Forest System roads and trails, the following is prohibited: (c) Damaging and leaving in a damaged condition any such road, trail, or segment thereof.
- In accordance with 36 CFR 261.15, use of vehicles off roads (h), it is prohibited to operate any vehicle off National Forest System, State, or county roads in a manner which damages or unreasonably disturbs the land, wildlife, or vegetative resources.
- As provided for in the Travel Management Rule, none of the alternatives preclude the forest from closing roads, trails, or areas to motorized use through emergency closure orders.

The public must continue to follow State and Federal rules and regulations as well as HNF regulations.

Types of Routes and Other Definitions

This analysis includes roads as they would be available for vehicles consistent with State laws. A mixed motorized use analysis and designation requires an engineering evaluation rather than a NEPA analysis. This will be completed as part of the implementation phase of this travel planning effort.

The following categories of routes used in this planning analysis are taken from the definitions in 36 CFR 212-Travel Management. The Forest Transportation System includes NFS roads (NFSR), NFS trails, and airfields on NFS lands. A glossary is located at the end of this document.

- Designated Road, Trail or Areas - NFS roads, NFS trails, or areas on NFS lands that are designated for public motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map.
- Mixed motorized use –NFS road for use by both highway-legal and non-highway-legal motor vehicles (FSM 7705).

- Motorized use – A term used to refer to travel by any motor vehicle (FSM 7705, FSH 2309.18.05); for purposes of this analysis, motorized use is considered use by wheeled motor vehicles (Not over-snow vehicles).
- Motorized 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.
- 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).
- Over-Snow Vehicle - A motor vehicle that is designed for use over-snow and runs on a track or tracks and/or a ski or skis. Over-snow replaces the term snowmobile. These terms may be found interchangeably throughout specialist reports.
- Road - A motor vehicle route over 50 inches wide, unless identified and managed as a trail.
- Route – A term used in this document to refer to a road or a trail.
- Trail - A route 50 inches or less in width that is identified and managed as a trail. Trails identified for motorized use are available for non-motorized use as well.
- Unauthorized Road or Trail - One that is not included in a forest transportation system. Unauthorized Road or Trail replaces old terms of non-system and unclassified route as well as user-created and undesignated. These terms may be found interchangeably throughout specialist reports.

Motorized Use within 300 Foot Buffers

The 2001 OHV decision provided for motorized uses within 300 feet of roads and trails for the purpose of dispersed camping and parking associated with dispersed camping. It required visitors to select campsites by non-motorized means and access the campsites by the most direct route causing the least damage. It also allowed for big game retrieval. The expectation was that relatively few new sites were developed within the 300 foot area, as most good camping/parking areas already have a road to them. The same is expected for the Divide Travel Planning Area as this area has a legacy of dispersed use. Many areas within 300 feet of an open route are already unsuitable for use due to terrain or vegetation limitations.

Continental Divide National Scenic Trail (CDNST)

The attached map displays the Continental Divide National Scenic Trail (CDNST) that is within the Divide Travel Planning Area. In the planning area there are portions of the CDNST that are located on designated (NFSR) roads and/or county roads. There are also places that the CDNST crosses or intersects these roads. In addition, there are sections of the CDNST that have some type of motorized use permitted. The descriptions provided in each alternative reflect these portions – identifying each road segment (with motorized activity) along the trail and the proposed designations for each segment under the action alternatives.

Features Common to All Action Alternatives

- If, through monitoring, the Forest Service finds that motor vehicle use on a route is directly causing adverse effects on public safety or on natural or cultural resources, it

may be closed immediately per 36 CFR 212.52(b)(2) until the Forest Supervisor determines that such adverse effects have been mitigated or eliminated. Depending on the situation, the Forest Service could try other means of preventing or repairing damage to natural or cultural resources.

- All motorized trails designated for vehicles 50 inches wide or less (which includes motorcycles) would be permitted in all the alternatives.
- Safe parking would be allowed within 30' from the edge of a designated motorized route for the purpose of any legal forest activity (FSM 7700).
- A portion of the Nevada Mountain IRA is located on the Lincoln Ranger District, and a portion of the Electric Peak IRA is located on the Beaverhead-Deerlodge National Forest (B-D NF). This travel plan proposal covers only the areas of each IRA located within the Divide Travel Planning area.
- Through this decision, closure methods would be limited to signs.
- Signs would be posted to clarify changes to the transportation system on the ground when possible.
- Road closure effectiveness for resource concerns would be monitored.
- Public notification of temporary closures would be completed through news releases and signing
- The stream crossing that provides access to the Larabee Gulch Trailhead on NFSR #227-D1 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- The stream crossing that provides access to Golden Anchor on NFSR #4100 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- Two unnamed stream crossings located on NFSR #495-D1 in T8N, R6W Section 28 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- Motorized over-snow use would have seasonal restrictions.
- Groomed snowmobile routes located on Forest roads and trails would be closed to wheeled motorized vehicles during their designated period of use.
- Seasonal restrictions would be placed on all trails open to motorized wheeled vehicles 50" and less.
- Roads would be open to over-snow motorized vehicles located in areas open to over-snow motorized vehicles to match the use of the surrounding area. All other motorized use would continue to be restricted from using these routes unless authorized for emergency or administrative uses.
- Existing snowmobile routes located on Forest roads would be closed to wheeled motorized vehicles when they are groomed.

Sweeny Creek Area

One notable change in the Sweeny Creek Area under Alternatives 2, 3, and 4 is the winter closure to motorized travel. Approximately 5,700 acres in that area (including the motorized trails) would be closed to over-snow motorized travel from October 16th thru May 14th.

The existing unauthorized motorized routes located in the Sweeny Creek Area would be designated as trails open to motorized vehicles 50 inches in width or less from May 16th thru October 14th. Although that area does not receive a great deal of over-snow vehicle use at the current time, it has become popular with OHV riders both during the winter and spring. Designation of these routes as system trails would provide another area on the Helena Forest specifically available for OHV use.

Continental Divide National Scenic Trail (CDNST)

Both motorized and non-motorized uses would occur across the 56 miles of the CDNST located within the planning area.

Alternative 1, No Action

The No Action Alternative is required under NEPA regulations [40 CFR 1502.14(d)]. This alternative represents the existing, baseline condition or trends by which the action alternatives are compared.

The No Action alternative would defer implementation of the Travel Management Rule, and would not result in a Motor Vehicle Use Map (MVUM). No changes would be made to the existing system of available public motorized routes and areas within the Divide Travel planning area.

No Action is represented by the current Helena National Forest map and supporting prohibitions. Permissible motorized uses include those routes and areas not otherwise prohibited, including use of approximately 16 miles of unauthorized or user-created routes. Under No Action, motorized access for dispersed camping, parking associated with camping.

The Helena National Forest Plan, as amended, prohibits wheeled cross country travel (2001 Tri-State OHV Decision). However, wheeled motorized use of unauthorized routes that existed at that time of that Forest Plan amendment are unaffected by this prohibition. That use is not defined as cross-country travel under the amended Forest Plan as long as the vehicle fits within the pre-existing width of the route. As discussed above, the motorized access for dispersed camping is an exception and that use is also permitted up to 300 feet from these routes. Under the No Action Alternative, these uses could continue.

Design Features

Kading-Limburger Springs Area

Under this alternative, Forest Road 1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR-504 would remain open to wheeled motorized vehicles 50” in width or less from May 16th through October 14th. This motorized activity would provide opportunities for Off Highway Vehicle (OHV) enthusiasts and hunters.

Motorized access on Forest Service Road #227-D1 would continue to provide limited wheeled motorized vehicle access (with a ford across the Little Blackfoot River) to a trailhead and Miller Cabin in Larabee Gulch. Although there is no road bridge across the Little Blackfoot River, the short spur road east of the river is currently open to motorized travel.

The existing non-system motorized routes located in the Kading area would be authorized as designated motorized trails open from May 16th through October 14th. These routes would be maintained as system trails.

Sweeny Creek Area

Existing unauthorized motorized routes located in the Sweeny Creek Area would continue to be open as motorized trails with no seasonal restrictions.

Continental Divide National Scenic Trail (CDNST)

There are approximately 9 miles of the CDNST which are currently open to wheeled motorized travel. Per Forest Service Manual (FSM) 2300 direction, motorized use would only be allowed on the CDNST if the route and type of use was in existence prior to November 10, 1978. Spur road 136-D1 was identified on the 1977 Helena Forest map as a trail open to motorized vehicles under 40 inches wide. As a result, any wheeled motorized vehicles exceeding 40" in width would not be authorized on Forest Road 136-D1.

Other motorized segments of the CDNST are roads which existed prior to November 10, 1978. In accordance with recent direction, those routes could continue to serve as segments of the CDNST if they are primitive and motorized use does not substantially interfere with the nature and purposes of the CDNST. Most of the existing motorized segments of the CDNST are located on Forest Roads #136, 495, 622, 1802, 1802-B2, and 1855. Motorized use on existing CDNST segments would continue. Approximately 19 miles of the CDNST would be closed to wheeled motorized travel. The existing single track trail segments in the vicinity of Priest Pass and Mullan Pass would remain open to motorized trail bikes. In addition, Forest Road #136–D1 would remain open to motorized use year- long.

Approximately 24.6 miles of the CDNST would continue to be open to wheeled motorized travel.

Approximately 8 miles of the CDNST would continue to be located in an area open to over-snow motorized vehicles.

Table 2.11 at the end of this chapter identifies the type of use the trail is currently being managed for. Some segments are on designated County roads and others are on a portion of the National Forest System Roads. The segments are arranged from north to south.

Unauthorized Routes

Identified unauthorized routes are considered open within the context of this alternative. Sixteen miles are identified as unauthorized routes which are currently open to wheeled motorized use. Any unauthorized routes not identified or included in this alternative are considered closed.

Accessibility

Under the existing condition there are no special for provisions to provide motorized access opportunities during big game rifle season.

Access to Dispersed Campsites

Under the existing condition, Alternative 1, the 2001 Tri-State Decision allowed off-vehicle camping within 300 feet of roads and trails; but, required visitors to select camp sites by non-motorized means and access the campsites by the most direct route causing the least damage.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Other Features

- Seasonal closures
- Larabee Gulch Trailhead stream crossing would remain open
- Two stream crossings on NFSR #495-D1 that provide access to motorized vehicles 50" or less from May 16 through October 14 on NFSR #4104A would remain open
- Stream crossing or ford access to Golden Anchor on NFSR #4100 would remain open
- Approximately 75 miles of road located within areas open to over-snow motorized use would continue to be closed to over-snow motorized vehicles

The following table reflects the miles for each type of use for Alternative 1, the existing condition. For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Table 2.1 Alternative 1, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition
Roads open to highway legal vehicles, no seasonal restrictions (OPEN-HWY-LEGAL)	286
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles	85
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8
Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2 – 5/15 (03-Res)	4
Roads closed to wheeled motorized vehicles yearlong (06-Res) Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7
Trails open to vehicles 50" or less in width 5/16-10/14	7
Trails open to vehicles 50" or less in width, no seasonal restriction	12
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16
Non-motorized system trail (NO MTR)	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2
CDNST open to wheeled motorized vehicles	24.6
CDNST located in an area open to over-snow motorized vehicles	8.0
CDNST located on State or County Jurisdiction	4.4

Alternative 2, Proposed Action

Alternative 2 was the proposed action presented to the public during the 2008 scoping period. This alternative was developed using the current Forest Transportation System maps, information from the 2004 Helena Roads Analysis, field verification, and public input.

Consistent with the travel planning regulations at 36 CFR 212 Subpart B, the resulting available wheeled motorized access routes and areas would be designated on a MVUM and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

For more specific detail regarding mileage please refer to Table 2.2 in addition to the alternative maps at the end of the document. If this alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001).

Design Features Specific to Alternative 2

Kading/Limburger Springs Area

NFSR #1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR 504 would remain open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th.

Sweeny Creek Area

The existing unauthorized motorized routes located in the Sweeny Creek Area would be designated as trails open to motorized vehicles 50 inches in width or less from May 16th thru October 14th. Designation of these routes as system trails would provide another area on the Helena Forest specifically recognized for OHV use. Although that area does not receive a great deal of over-snow vehicle use at the current time, it has become popular with OHV riders both during the winter and spring.

One notable change in the Sweeny Creek Area under Alternatives 2 is the winter closure to motorized travel. Approximately 5,700 acres in that area (including the motorized trails) would be closed to over-snow motorized travel from October 16th thru May 14th.

Continental Divide National Scenic Trail (CDNST)

Under this alternative the majority of Forest Road #136-D1 (2 miles) would be closed to wheeled motorized vehicles year-long. The remaining 0.5 miles, which provide access to existing stock facilities and trailhead parking, would remain open to highway legal vehicles year-long.

Approximately 22.5 miles of the CDNST would be open to wheeled motorized travel.

Approximately 19.3 miles of the CDNST would be closed to wheeled motorized vehicles.

Approximately 12 miles of the CDNST would be located in an area open to over-snow motorized vehicles.

Please see Table 2.11 at the end of this chapter for a comparison of alternatives in CDNST trail designations.

Unauthorized Routes

Alternative 2 would designate approximately 10 miles of identified unauthorized routes to be added to the Forest Transportation System. The existing unauthorized routes not identified or included in this alternative would be considered closed.

Accessibility

NFSRs #335-A1 and A2, #1856, and #314-J3 would be open from October 15th through December 1st to provide additional motorized access during big game rifle season.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Access to Dispersed Campsites

Under Alternatives 2, parking safely adjacent to a road within 30 feet from the edge of the road or motorized trail would be allowed. In addition, wheeled motorized vehicle travel for camping or parking associated with camping would be allowed within 300 feet of designated system routes, including roads and trails (unless signed otherwise or specifically closed) as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

Access to dispersed camping is identified as an acceptable use in the planning area under the 2001 Tri-State Decision and the 2005 Travel Management Rule. Agency personnel have observed that, in general, this has occurred without causing unacceptable resource damage. Where site-specific issues have occurred, emergency closures were issued for resource protection. The Forest Service has this tool available when needed; therefore, the HNF is proposing to continue this practice under this alternative.

Other Features

- There would be winter closures in Hahn Creek areas as well as lower elevation west facing slopes in Clarks Canyon north to Threemile Creek.
- Areas that remain open would have a season of December 2nd through May 15th for motorized over-snow travel.
- The stream crossing that provides access to the Larabee Gulch Trailhead on NFSR #227-D1 would be closed to motorized use until the ford could be replaced with a bridge, bottomless arch or culvert.
- Two stream crossings on NFSR #495-D1 that provide access to Motorized Vehicles 50” or less from May 16 through October 14 on NFSR #4104A would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.

The following table reflects the miles for each type of use for Alternative 2 in comparison to the No Action Alternative. The proposed changes listed in the table below include approximately 10 miles of currently unauthorized or user created routes that would be added. For additional details, refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Table 2.2 Alternative 2, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2
Roads open to highway legal vehicles, no seasonal restrictions (OPEN-HWY-LEGAL)	286	284
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	16
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res)	4	7
Open to over snow motorized vehicles 12/2-5/15 (03-Res)	4	7
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	10
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	112
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0
Open to over snow motorized vehicles 12/2-5/15 (06-Res)	0	112
Open designated routes to over snow motorized vehicles 12/2-5/15 (06-Res-Spc)	0	2
Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	10
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0
Trails open to vehicles 50” or less in width 5/16-10/14	7	25
Trails open to vehicles 50” or less in width, no seasonal restriction	12	1
Trails closed to motorized vehicles yearlong (MT-01-Res)	0	2
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16	10
Non-system roads, closed to motorized vehicles yearlong (NS-01-Res)	0	6
Non-motorized system trail (All Alternatives) (NO MTR)	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2	19.3
CDNST open to wheeled motorized vehicles	24.6	22.5
CDNST located in an area open to over-snow motorized vehicles	8.0	12.0
CDNST located on State or County Jurisdiction	4.4	4.4

Alternative 3

Comments received in the 2008 scoping process included comments regarding the desire to enjoy the outdoors in its natural state without the interruption of motorized use. Alternative 3 was developed in response to public comments regarding wildlife security issues, non-motorized

uses, and general resource concerns relative to erosion and sedimentation from road conditions.

Consistent with the travel planning regulations at 36 CFR 212 Subpart B, the resulting available wheeled motorized access routes and areas would be designated on a MVUM and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

For more specific detail regarding Alternative 3, refer to Table 2.3. If this alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001).

Design Features Specific to Alternative 3

Kading-Limburger Springs Area

The Kading/Limburger Springs area would incorporate additional motorized closures. Under this alternative, NFSR #1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR 504 would be closed to wheeled motorized vehicle travel year-long; however, open to over-snow motorized vehicles from December 2nd through May 15th. This would also apply to non-system trails MTR-502, MTR-503 and MTR-504.

Current OHV travel for wheeled motorized vehicles 50" or less would be prohibited. Existing over-snow motorized travel on those routes would continue.

NFSR #227 would be closed just past the Kading Campground with NFSR #227-E1 becoming a non-motorized trail.

Sweeny Creek Area

The existing unauthorized routes located in the Sweeny Creek Area would be closed to motorized travel year-long. With exception of the Priest Pass Road, all routes in the Sweeny Creek area would be closed year-long to all motorized use including over-snow vehicles.

Similar to Alternative 2, approximately 5,700 acres in that area would be closed to over-snow motorized travel.

Continental Divide National Scenic Trail (CDNST)

Under this alternative the majority of Forest Road #136-D1 (2 miles) would be closed to wheeled motorized vehicles yearlong. The remaining 0.5 miles, which provide access to existing stock facilities, would remain open to highway legal vehicles yearlong. Approximately 0.6 additional miles of CDNST would be closed to wheeled motorized travel over Alternative 1.

Existing single track trail segments would be closed to wheeled motorized travel year-long.

The area south of Highway 12 along the Continental Divide from MacDonald Pass to Jericho Mountain would be closed to over-snow vehicles, except on designated routes.

Approximately 20.6 miles of the CDNST would be open to wheeled motorized travel.

Approximately 19.3 miles of the CDNST would be closed to wheeled motorized vehicles.

Approximately 10.1 miles of the CDNST would be located in an area open to over-snow motorized vehicles.

Please see Table 2.11 at the end of this chapter for a comparison of alternatives in CDNST trail designations.

Unauthorized Routes

Alternative 3 would designate approximately 9 miles of identified unauthorized routes that would be added to the Forest Transportation System. The existing unauthorized routes not identified or included in this alternative would be considered closed

Accessibility

There would be no special provisions to provide motorized opportunity considerations for motorized access during the big game rifle season under this alternative.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Access to Dispersed Campsites

Under Alternatives 3, parking safely adjacent to a road within 30 feet from the edge of the road or motorized trail would be allowed. In addition, wheeled motorized vehicle travel for camping or parking associated with camping would be allowed within 300 feet of designated system routes, including roads and trails (unless signed otherwise or specifically closed) as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

Access to dispersed camping is identified as an acceptable use in the planning area under the 2001 Tri-State Decision and the 2005 Travel Management Rule. Agency personnel have observed that, in general, this has occurred without causing unacceptable resource damage. Where site-specific issues have occurred, emergency closures were issued for resource protection. The Forest Service has this tool available when needed; therefore, the HNF is proposing to continue this practice under this alternative.

Other Features

- NFSR #314 would be closed year-long to motorized wheeled vehicles past the gate in Section 7.
- NFSRs #314-J1 and J3 would also be closed year-long.
- Non-System Motorized Trails #501, #503, #502, and #1868 and NFSR #1871-002 would be closed to wheeled motorized use year-long.
- The stream crossing that provides access to the Larabee Gulch Trailhead on NFSR #227-D1 would be closed to motorized use until the ford can be replaced with a bridge, bottomless arch or culvert.
- Two stream crossings on NFSR #495-D1 that provides access to Motorized Vehicles 50” or less on NFSR #4104A would be closed under this alternative.

The following table reflects the miles for each type of use for Alternative 3 in comparison to the No Action Alternative 1. The proposed changes listed in the table below include approximately 9

miles of currently unauthorized or user created routes that would be added. For additional details, refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Table 2.3 Alternative 3, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 3
Roads open to highway legal vehicles, no seasonal restrictions (OPEN-HWY-LEGAL)	286	262
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	21
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res)	4	7
Open to over snow motorized vehicles 12/2-5/15 (03-Res)	4	7
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	3
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	156
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0
Open to over snow motorized vehicles 12/2-5/15 (Alt 3) (06-Res)	0	156
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0
Trails open to vehicles 50” or less in width 5/16-10/14	7	0
Trails open to vehicles 50” or less in width, no seasonal restriction	12	0
Trails closed to motorized vehicles yearlong (MT-01-Res)	0	19
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16	9
Non-system roads, closed to motorized vehicles yearlong (NS-01-Res)	0	7
Non-motorized system trail (NO MTR) (not including CDNST segments)	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2	19.3
CDNST open to wheeled motorized vehicles	24.6	20.6
CDNST located in an area open to over-snow motorized vehicles	8.0	10.1
CDNST located on State or County Jurisdiction	4.4	4.4

Alternative 4

Alternative 4 was developed in response to public comments. This alternative addresses both social and resource concerns identified by the public.

Consistent with the travel planning regulations at 36 CFR 212 Subpart B, the resulting available wheeled motorized access routes and areas would be designated on a MVUM and public use of a motor vehicle other than in accordance with those designations would be prohibited as per 36 CFR 261.13.

For specific detail regarding Alternative 4, refer to the table below. If this alternative is selected, it would meet the intent of subsequent site-specific planning as required by the 'Off-Highway Vehicle Record of Decision and Forest Plan Amendment' (January 2001).

Design Features Specific to Alternative 4

Kading-Limburger Springs Area

With the exception of over-snow vehicles during the winter, the unauthorized trails in the Kading area would be closed to wheeled motorized use.

Kading/Limburger Springs areas would be closed to wheeled motorized use year-long for resource and winter wildlife protection.

FSR #227 would be closed at the turn around located just past Kading Campground and FSR #227-E1 would be closed to wheeled motorized vehicles year-long.

NFSR #1868, Kading Grade (MTR-502), and routes 501, MTR-503 and MTR 504 would be closed to wheeled motorized vehicle travel year-long; however, open to over-snow motorized vehicles from December 2nd through May 15th. This would also apply to non-system trails MTR-502, MTR-503 and MTR-504.

Sweeny Creek Area

Like Alternative 3, the existing unauthorized routes located in the Sweeny Creek area would be closed to motorized travel year-long for resource and winter wildlife protection. Similar to Alternatives 2 and 3, approximately 5,700 acres in that area would be closed to over-snow motorized travel. This area does not receive a great deal of over-snow vehicle use.

Continental Divide National Scenic Trail (CDNST)

Under this alternative the majority of Forest Road #136-D1 (2 miles) would be closed to wheeled motorized vehicles year-long. The remaining 0.5 miles, which provide access to existing stock facilities, would remain open to highway legal vehicles year-long. In addition Forest Road #1802 would be closed to motorized vehicles year-long.

Forest Road #1802 existed prior to November 10, 1978. Therefore, to meet agency direction for the CDNST, it "should not be closed to wheeled motorized travel".

Additional segments of the CDNST would be closed to wheeled motorized use. This includes the microwave tower road FSR#1802(please refer to the table below for specifics on each segment of the route).

Approximately 18 miles of the CDNST would be open to wheeled motorized travel.

Approximately 21.9 miles of the CDNST would be closed to wheeled motorized vehicles.

Approximately 12 miles of the CDNST would be located in an area open to over-snow motorized vehicles.

Please see Table 2.11 at the end of this chapter for a comparison of alternatives in CDNST trail designations.

Unauthorized Routes

Alternative 4 would designate 6 miles of identified unauthorized routes that would be added to the Forest Transportation System. The existing unauthorized routes not identified or included in this alternative would be considered closed.

Accessibility

There would be no special provisions to provide motorized opportunity considerations for motorized access during the big game rifle season under this alternative.

For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Access to Dispersed Campsites

Alternative 4 would permit wheeled motorized vehicle travel within 300 feet of designated system routes, including roads and trails (unless signed otherwise). It would allow motorized travel in this zone for legal recreational activities, in addition to camping and parking associated with dispersed camping. Legal recreation activities include, but are not limited to, parking, camping, big game retrieval, hiking, hunting, or firewood gathering. These activities would be allowed as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

The following table reflects the miles for each type of use for Alternative 4 in comparison to the No Action Alternative 1, No Action alternative. The proposed changes listed below would include approximately 10 miles of currently unauthorized or user created routes that would be added. For additional details, please refer to the map packet and Appendix E for information that reflects each individual route by proposed designation (open/seasonal restrictions/closed) by alternative.

Other Features

- There would be winter closures in the Hahn Creek area as well as lower elevation west facing slopes in Clarks Canyon north to Threemile Creek.
- FSR #1802 and FSR #1802-C1 would be closed to wheeled motorized vehicles year-long.
- FSR #314 in the Spotted Dog area would be open to highway legal vehicles from 5/16 to 10/14 and closed to wheeled motorized vehicles from 10/15 to 5/15.
- Areas that remain open would have a season of December 2 through May 15 for motorized over-snow travel.

Table 2.4 Alternative 4, Miles of Each Type of Use

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 4
Roads open to highway legal vehicles, no seasonal restrictions (All Alternatives) (OPEN-HWY-LEGAL)	286	265
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	25
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2-5/15 (03-Res)	4	3
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	10
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	139
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0
Open to over snow motorized vehicles 12/2-5/15 (06-Res)	0	139
Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	3
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0
Trails open to vehicles 50” or less in width 5/16-10/14	7	4
Trails open to vehicles 50” or less in width, no seasonal restriction	12	0
Trails closed to motorized vehicles yearlong (MT-01-Res)	0	20
Open non-system roads and trails (UOPEN-HWY-LEGAL)	16	10
Non-system roads, closed to motorized vehicles yearlong (NS-01-Res)	0	6
Non-motorized system trail (ATM NOMTR) (not including CDNST segments)	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.2	21.9
CDNST open to wheeled motorized vehicles	24.6	18.0
CDNST located in an area open to over-snow motorized vehicles	8.0	12.0
CDNST located on State or County Jurisdiction	4.4	4.4

Proposed Forest Plan Programmatic Amendment for the Big Game Security Index

Detailed information and background for the proposed programmatic plan amendment is located in Appendix D. This section provides an overview of the proposed changes to forestwide

standard 4a. This amendment could be common to all alternatives. This would be a separate decision as per 36 CFR 219. Alternative A describes the existing condition – the current Forest Plan standard 4a. Alternative B describes the proposed amendment to the HNF plan.

Alternative A, Existing Condition

Alternative A, the No Action Alternative, is the existing Forest Plan Standard. In this case, 'no action' means no amendment to the existing Forest Plan. The analysis of effects associated with Alternative A describes the effects of the current Forest Plan standard. The exact language of the current standard is as follows:

Forestwide Standard Big Game 4(a) (HFP pp. II/17 – II/18)
Road management will be implemented to at least maintain big game habitat capability and hunting opportunity. To provide for a first week bull elk harvest that does not exceed 40 percent of the total bull harvest, roads will be managed during the general big game hunting season to maintain open road densities with the following limits.

Forest Plan Big Game Security Index		
Existing Percent Hiding Cover (1)	Existing Percent Hiding Cover (2)	Max Open Road Density mi/mi^2
56	80	2.4
49	70	1.9
42	60	1.2
35	50	0.1

(1) Forest Service definition - a timber stand which conceals 90 percent or more of a standing elk at 200 feet.
(2) MDFWP definition - a stand of coniferous trees having a crown closure of greater than 40 percent.

The existing hiding cover to open road density ratio should be determined over a large geographic area, such as a timber sale analysis area, a third order drainage, or an elk herd unit.

Big game security, according to this standard, is based on the relationship between the amount of hiding cover in an Elk Herd Unit (EHU) and the open road density during big game rifle season. Hiding cover is defined (HFP p. II-18) as either a timber stand which conceals 90% or more of a standing elk at 200 feet, which can only be measured in the field, stand by stand; or as stands of coniferous trees having a crown closure greater than 40%, which can be determined by aerial photo interpretation and satellite imagery[1]. Under the Forest Plan, either method is acceptable (USDA 1986, p. II/18). Open road densities include all motorized routes open during the big game rifle season, October 15 through December 1, and are calculated at 100% the length of all public roads and 25% the length of private roads. This relationship was based on research that

[1] This analysis utilizes the MDFWP definition of hiding cover – i.e. stands of coniferous trees having a crown closure greater than 40%. The 40% canopy cover metric is an acceptable 'proxy' for mapping hiding cover as it is generally assumed that stands with 40% canopy cover or greater would in turn provide adequate screening cover that would hide 90% of an elk at 200 feet, the functional definition of hiding cover . This relationship of canopy cover and stand structure is based on modeling done by Lonner and Cada (1982) and others that used canopy cover to predict the relationship between hiding cover (as estimated by canopy cover), road densities, and harvest rate the first week of the general hunting season.

indicated roads with less use have reduced impacts to elk (Perry and Overly 1976, Witmer and deCalesta 1985, and Rowland et al. 2000).

The big game security index is calculated for EHUs that include all lands, public and private, within the respective EHU. This means that elk security as determined by this index is also a function of road densities and timber harvest on private lands outside management control of the HNF. Elk may use habitat differently relative to hiding cover and motorized routes on private land which often has different hunting pressure levels than public land. Table 2.5 summarizes the current status of each EHU in the Divide Travel Plan project area relative to this index and includes reference to MDFWP's population objectives which are described in further detail in the section *Correlation between Standard 4(a) and Elk Numbers.*

Only one (Jericho) of the six EHUs in the Divide Travel Plan project area meets the big game security standard threshold (Big Game standard #4a: HFP p. II-18) under current conditions. Relative to MDFWP population objectives, four EHUs fall within HD 293 that is below MDFWP population objectives for elk numbers but above objectives for bull/cow ratio objectives (Greenhorn, Jericho, Little Prickly Pear/Ophir, and Spotted Dog/Little Blackfoot). Note that the one EHU that ***does*** meet Big Game Standard 4(a) occurs within HDs that are across the board in terms of MDFWP population objectives, which suggests that the current standard may be insensitive to elk population responses to their environment and/or factors outside of Forest management are influencing elk.

Even if all open motorized routes managed by the Forest were eliminated, three of the six EHUs (Greenhorn, Little Prickly Pear/Ophir, and Quartz Creek) would still not comply with Standard 4(a). This is due to hiding cover comprising less than 50% in those herd units. One of the EHUs (Black Mountain/Brooklyn Bridge) would require closure of 140 miles of its roads to achieve compliance.

Big game security in the Divide Travel Plan project area, as currently measured under the Forest Plan, will not improve in the foreseeable future because hiding cover will continue to decline as trees killed by the ongoing bark beetle epidemic begin to fall *en masse* over the next few years. Motorized route density management on the Helena National Forest cannot compensate for this loss of cover, so the standard as currrently written will remain largely unmet. At the same time, elk numbers and bull/cow rations in the project area vary in terms of MDFWP's objectives depending on the respective HD.

Table 2.5 Big Game Security – Hiding Cover Relative to Open Road Density

Elk Herd Unit (Associated Hunting District – HD)	Total Square Miles	Acres Hiding Cover[1]	Percent Hiding Cover[1]	Miles of Open Road (10/15-12/1)	Open Road Density (10/15-12/1)	Meets HFP Standard #4a	MDFWP HD Population Objectives[2]	Current Status of Population Objectives based on MDFWP Aerial Survey Data
Black Mountain/ Brooklyn Bridge (HDs 335, 343)	88	29,260	52%	166	1.9	No	*HD 335* 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Greenhorn (HDs 293, 335, 343)	88	16,871	30%	155	1.8	No	*HD293* 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Jericho (HDs 215, 293, 335, 343)	55	23,091	65%	68	1.2	Yes	*HD 215* 1000 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio above objectives
							HD293 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives

Elk Herd Unit (Associated Hunting District – HD)	Total Square Miles	Acres Hiding Cover[1]	Percent Hiding Cover[1]	Miles of Open Road (10/15-12/1)	Open Road Density (10/15-12/1)	Meets HFP Standard #4a	MDFWP HD Population Objectives[2]	Current Status of Population Objectives based on MDFWP Aerial Survey Data
Little Prickly Pear/ Ophir (HDs 293, 343)	136	40,222	46%	220	1.6	No	*HD293* 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Quart Creek (HD 335)	57	16,477	45%	62	1.1	No	*HD 335* 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
Spotted Dog/ Little Blackfoot (HDs 215, 293, 335)	129	48,306	59%	148	1.2	No	*HD 215* 1000 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio above objectives
							HD293 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio

[1] Cover as defined by MDFWP – - a stand of coniferous trees having a crown closure of greater than 40 percent
[2]See Table D.3 *Elk Management Units (EMU), Hunting Districts and Elk Herd Units (EHU) within the Divide Travel Project Area* in Appendix D for the relationship between the EHUs and MDFWP hunting districts.

Alternative B

Alternative B was designed to address best science and local knowledge. It also expanded consideration to all open motorized routes (whereas Alternative A only applies to roads as originally envisioned in the Forest Plan). Alternative B would replace the existing Forest Plan Big Game Standard 4(a). The Divide Travel Plan project area encompasses only about ¾ of the Divide landscape (portions of the Quartz, Black Mtn – Brooklyn Bridge, and Little Prickly Pear – Ophir EHUs falling into areas covered by previous travel management plans); however, the proposed amendment would apply to all portions of the herd units included in the Divide Travel Plan analysis. Under the Forest Plan amendment proposed for the Divide Travel Plan—and applicable to future projects in the Travel Plan Area—the "security area" approach would replace the "road density/hiding cover index" as the Forest Plan standard for gauging the vulnerability of elk to hunting. The amendment derives from the Hillis methodology (1991) and adopts specific guidelines for its application from *Recommendations for Big Game Habitat Management on the Custer, Gallatin,Helena, and Lewis and Clark National Forests* (MDFWP and USDA Working Group 2013). The exact language of the standard is as follows:

Standard

Implement an aggressive road management program to maintain or improve big game security. This will be accomplished in the Divide Landscape of the Helena National Forest by way of the following:

When security areas comprise more than 30% of that portion of an elk herd unit within the HNF administrative boundary, management activities shall not reduce the amount of security areas during the rifle season (approximately October 15 through December 1) to less than 30%. Where security areas comprise 30% or less of that portion of an elk herd unit within the HNF administrative boundary during the general rifle season, management activities shall not result in a further reduction.

Definition

Security Area – a block of big game habitat, 250 acres or larger, that is generally at least ½ mile from any open motorized route during the rifle big game hunting season (10/15 – 12/1).

Comparison of Amendment Alternatives

This section describes the effects of the two amendment alternatives (A and B) relative to the four Travel Plan alternatives (1-4). It discusses relative changes in the way elk security is enumerated between Alternatives A and B. Effects of the Travel Plan alternatives on other pertinent aspects of elk ecology and management are discussed in the DEIS.

Alternative A (Existing Condition)

Alternative A is the No Action Alternative, the current Forest Plan standard. Table 2.6 summarizes the status of each EHU in the Divide Travel Plan project area by Travel Plan alternative relative to this index (Big Game Standard #4a (USDA 1986, p. II/17 – II/18).

Table 2.6 Hiding cover, weighted open road density, and consistency with Forest Plan Big Game Standard 4(a), by Elk Herd Unit, under the Divide Travel Plan alternatives

Elk Herd Unit	% Hiding	Open Road Density (mi/mi²)				Complies with *Forest Plan* Big Game Standard 4(a)?			
	Cover	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Black Mountain – Brooklyn Bridge	52%	1.9	1.8	1.9	1.9	no	no	no	no
Greenhorn	30%	1.8	1.6	1.5	1.5	no	no	no	no
Jericho	65%	1.2	1.2	1.1	1.1	yes	yes	yes	yes
Little Prickly Pear—Ophir	46%	1.6	1.5	1.5	1.5	no	no	no	no
Quartz	45%	1.1	1.1	1.1	1.1	no	no	no	no
Spotted Dog – Little Blackfoot	59%	1.2	1.2	1.0	1.0	yes	yes	yes	yes

Only one of the 6 elk herd units (EHUs) in the Divide Travel Plan project area meets the hiding cover/ open road density standard (Big Game standard #4a: HFP, p. II-18) under current conditions. The EHU that meets the standard (Jericho) would continue to do so under each of the three Travel Plan action alternatives. Of the 5 herd units currently out of compliance with Standard 4(a), two would move closer to compliance under each of the action alternatives (because of lower open road densities) and two would remain unchanged.

Although open road densities decrease in most EHUs under the action alternatives as compared to existing conditions (Alternative 1), application of the existing Big Game Standard 4(a) to the Travel Plan alternatives reveals no change relative to the existing standard. These proposed reductions in hunting season road access (with consequent benefits for elk) do not result in any of the sub-standard EHUs moving into compliance with standard 4(a). This illustrates the concern that the big game security index, as currently defined in the Forest Plan, is not a particularly sensitive indicator of changing elk security conditions. These EHUs will never be able to meet the existing standard as long as available cover is below the minimum 50% threshold. No amount of road management will improve that condition. Even though all the action alternatives are expected to maintain or improve existing elk security in each EHU through reductions in road densities, this improvement cannot be reflected in the simplistic yes/no results used to report compliance with the current standard. Furthermore, Alternative A does not provide a measure on how unroaded areas are distributed within a respective herd unit. Several authors describe the importance of distribution of large unroaded areas for security (e.g. Lyon et al. 1985, pp. 7-8; Lyon and Canfield 1991, pp. 104-105; Canfield 1991, pp. 50-51; Christensen et al. 1993 p. 4, 5; McCourquodale 2013, p. 9). Road density data alone does not address distribution of 'unroaded' areas.

Even if it were possible to close all of the roads in the project area (several miles of roads are outside of the Forest Service's jurisdiction), some of the concerns identified by MDFWP in the *Montana Final Elk Management Plan* (MDFWP 2004) would not be ameliorated especially in those HDs where access to elk is a management concern.

In a word, the hiding cover/ open road density index, as now formulated, is insensitive to real

changes in elk security and it places impractical constraints on Forest management and on the ability of the public to use the Forest (even though the allowed use is not detrimental to elk security). The standard will be impossible to meet throughout most of—and possibly all of—the Divide landscape for the foreseeable future (25-50 years), not because of deficiencies in travel management, but because of natural loss of hiding cover.

Alternative B – (Proposed Alternative)

Alternative B utilizes the concept of the percentage of an area in security to enumerate the resulting elk security differences between the Travel Plan alternatives. The actual on-the-ground results regarding NFS road management and the changes in elk security are the same as under alternative A, only the method of describing those results has changed. Table 2.7 displays total acres and percent of elk security as calculated under this alternative. The results apply only to that portion of the EHU that is within the administrative boundary of the Helena National Forest and are based on blocks greater than or equal to 250 acres located greater than or equal to ½ mile from motorized routes that are open during the hunting season (10/15 through 12/1). The table also displays how this security is arranged on the landscape, relative to the number of security blocks established under each Travel Plan alternative.

Table 2.7 summarizes the current contribution of HNF lands to elk security. The methodology used to delineate the security areas is described in the Wildlife Specialist Report and includes consideration of topography, proximity to local population centers, travel corridors, and to a lesser extent cover. Although the proposed standard identifies 250 acres as the minimum patch size for security, in application only those blocks that were greater than 300 acres were considered secure.

As can be seen in Table 2.7, elk security areas provide a means of gauging elk security that is sensitive to changes in open motorized route configuration. This allows a more realistic assessment as to potential impacts of travel management proposals in different herd units than the current HFP Standard (the Big Game Security index), which shows no difference between any of the alternatives in terms of Forest Plan compliance. The difference between the two methods is largely a function of eliminating hiding cover as a primary determinant of elk security and focusing on the size and distribution of large habitat blocks to which vehicle access is limited. This is particularly appropriate in this case, as Travel Plan alternatives deal with changes in open road patterns and generally have no impact on hiding cover. However, Forest Plan standards remain in place that recognize the importance of elk hiding cover (i.e. Forest-wide Big Game Standards 3, 5 and several management area specific standards).

Among the three Travel Plan action alternatives, Alternatives 3 and 4 generally serve to consolidate security areas into larger contiguous blocks resulting in an increase in total overall acres of security and a larger average size of security areas as compared to the existing condition. In turn, this could affect sex and age structure of elk as ell as serve to retain more elk on public land. Improvements in elk security can reduce bull mortality and subsequently can improve bull:cow ratios (Leptich and Zager 1991, p. 129, 130).

Table 2.7 Elk Security during the Hunting Season (10/15 – 12/1) under Alternative B by Travel Plan Alternative

Elk Herd Unit (Total Acres within Administrative Boundary)	Alt. 1			Alt. 2			Alt. 3			Alt. 4		
	Acres of Elk Security	# of Security Blocks[1]	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)
Black Mountain – Brooklyn Bridge (35,873)	13983	2	39	13983	2	39	13983	2	39	13983	2	39
Greenhorn (21,693)	3433	4	16	7097	5	33	7419	5	34	7921	4	37
Jericho (29,363)	8753	3	30	6523	2	22	9333	3	32	9333	3	32
Little Prickly Pear - Ophir (59,310)	14204	3	24	17062	4	29	17062	4	29	17062	4	29
Quartz Creek (23,036)	7038	4	31	7038	4	31	7038	4	31	7038	4	31
Spotted Dog/ Little Blackfoot (63,561)	28800	5	45	27024	4	43	33046	3	52	31872	4	50

[1] The total number of Security Blocks reflects the actual number on the landscape. Some Security Blocks overlap EHU boundaries and are located within 2 or more EHUs

Alternative Conclusions

Implementation of Alternative B should reduce and/or eliminate elk displacement from public land prior to normal migration events. This addresses a primary management goal for MDFWP: maintaining or enhancing elk presence on NFS lands so that elk are available to the hunting public on public land. Several studies indicate that elk may find more complete security during hunting seasons by moving to private lands that restrict hunter access or prohibit hunting (Burcham et al. 1999, Proffitt et al. 2013). This response to hunting risk may result in elk herds that spend increasing amounts of time on privately owned lands and limit the ability to manage herd sizes through harvest (Haggerty and Travis 2006). Implementation of Alternative B can also lead to improvements in bull:cow ratios (Leptich and Zager, p. 129, 130). However, elk distribution can be affected through road management and establishment of security areas over time (Rowland et al. 2005 and McCorquodale 2003) in turn providing MDFWP the flexibility to achieve their population objectives.

Summary and Conclusions

One of the objectives of the Divide Travel Plan is to avoid imposing outdated management direction contained in the *Helena Forest Plan* (USDA 1986) on the road and trail system of the Divide landscape. The argument for doing so with regard to big game security standards has been made in previous sections. This section condenses those rationale into a more compact format.

The Travel Plan is designed to maintain a road and trail system that provides the public with reasonable access to the National Forest and allows the Forest Service to manage the landscape with some efficiency, while, at the same time, buffering as much of the wildlife resource as possible from problems generated by motor vehicles and disruptive human presence in general. Part of the process of balancing the need for road access with the security requirements of big game animals entails developing a system of habitat assessment and management guidance that can accurately depict the security status of elk in a given area and appropriately address any problems detected. Experience with the Forest Plan over the last couple decades has led HNF wildlife biologists to conclude that elk security standards in the Plan [particularly big game standard 4a (USDA 1986, p. II/17 – II/18)] do not accurately reflect the habitat needs of elk during the hunting season and have required road closures that restrict travel but often do not improve elk security.

In particular:

- *Forest Plan* standard #4a (the big game security index) indicates that five of the 6 EHUs in the Divide landscape are deficient in elk security to the point that they do not meet the standard.
- Despite the fact that five out of 6 EHUs do not meet Forest Plan Standard 4(a), elk numbers have been steadily increasing since the crafting of the Forest Plan in 1986. Aerial survey data collected by Montana Department Fish, Wildlife, and Parks staff through 2011 indicate that there are at least 10,727 elk within the hunting districts that comprise the Helena National Forest. This is well above the 6400 benchmark identified in the Forest Plan.
- MDFWP data indicate that elk populations in the Divide landscape are either at or near population objectives of the *Montana Final Elk Management Plan* (2004) for the last

several years for most of the HDs; or that management challenges are are only partially habitat related. That is, elk security is adequate in many HDs. The existing FP standard is not an accurate indicator of elk security.

- In spite of the fact that the Travel Plan alternatives close miles of routes to vehicle access during the hunting season, big bame standard 4(a) indicates that there is no improvement in elk security in any unit.
- In several herd units, not even the closure of all roads managed by the Helena National Forest would be enough to meet standard 4(a). In 4 herd units, current hiding cover percentages require that all open roads, public and private, be closed in order to meet standard #4a. In a 4th herd unit approximately 140 miles of roads would need to be closed if the standard is to be met.. These requirements are impractical on a grand scale. And the HNF is put in the position of never being able to meet standard 4(a) in these herd units in the foreseeable future (even while elk continue to thrive).
- By introducing reasonably measurable criteria as part of the formula for guaging the level of security needed in a given herd unit, the new standard provides a more realistic means of guiding travel management on the National Forest.

In conclusion, Forest Plan big game standard 4(a) inaccurately depicts the nature of elk security in the Divide landscape, is insensitive to changing road densities, and places unnecessary and impractical constraints on travel management. Meanwhile, the more recently developed elk security area methodology provides a reasonably accurate picture of elk security across the landscape, is responsive to proposed changes in open road patterns, and correctly directs management to areas that need further attention.

Although this amendment would eliminate cover measurements as part of the determination of elk security, it would not change other elk or big game related standards relative to the analysis and maintenance of cover, notably Big Game Standards 1, 2, 3, and 5. Big Game Standards 4b thru 4h and 6 regarding road management activities are also still in effect.

Elk are a management indicator for commonly hunted species. As such, they are intended to be a bellwether of the effects of management activities on representative wildlife habitats with the objective of ensuring that viable populations of existing native and desirable non-native animal species are maintained. Current elk numbers are well above those established as benchmarks in the 1986 Forest Plan, benchmarks intended to ensure that elk remain viable and huntable on the Helena National Forest.

Comparison of Alternatives

This summary provides a comparison of the proposed changes for motorized and non-motorized use for each alternative. In addition it summarizes the differences in proposed management for each segment of the CDNST for each alternative.

Table 2.8 Summary of the Proposed Changes for Motorized/non-motorized Use for Each Alternative (miles)

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2	Alt. 3	Alt. 4
Roads open to highway legal vehicles, no seasonal restrictions (All Alternatives) (OPEN-HWY-LEGAL)	286	284	262	265
Private roads within planning area boundary (All Alternatives) (PVT)	99	99	99	99
State or County Road (CO)	70	70	70	70
State or County Road (STATE)	34	34	34	34
Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	85	16	23	27
Roads open to highway legal vehicles 12/2-10/14 (02-Res) Open to over snow motorized vehicles 12/2-10/14 (02-Res)	8	0	0	0
Roads open to highway legal vehicles 5/16-12/1 (03-Res)	4	7	7	3
Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2 – 5/15 (03-Res)	4	0	0	0
Open to over snow motorized vehicles 12/2-5/15 (03-Res)	0	7	7	3
Roads open to highway legal vehicles 5/16-10/14 (05-Res) Open to over snow motorized vehicles 12/2-5/15 (05-Res)	0	10	3	10
Roads closed to wheeled motorized vehicles yearlong (06-Res)	42	110	154	137
Open to over snow motorized vehicles 12/2-10/14 (06-Res)	42	0	0	0
Open to over snow motorized vehicles 12/2-5/15 (06-Res)	0	110	154	137
Open designated routes to over snow motorized vehicles 12/2-5/15 (06-Res-Spc)	0	2	0	0
Roads open to highway legal vehicles 10/15-12/1(07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	10	0	3
Roads open to wheeled motorized vehicles 6/1-8/31 (13-Res) Open to over snow motorized vehicles 12/1-8/31 (13-Res)	8	0	0	0
Roads open to wheeled motorized vehicles 5/16-4/14 (15-Res) Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	7	0	0	0
Trails open to vehicles 50” or less in width, no seasonal restriction	12	1	0	0

Type of Use (Corresponding designation on Alternative Maps)	Alt. 1 Existing Condition	Alt. 2	Alt. 3	Alt. 4
Trails open to vehicles 50” or less in width 5/16-10/14	7	25	0	4
Trails closed to motorized vehicles yearlong (ATM MT-01-Res)	0	2	19	20
Open non-system roads and trails (Alt 1) (UOPEN-HWY-LEGAL)	16	10	9	10
Non-system roads, closed to motorized vehicles yearlong (01-Res)	0	6	7	6
Non-motorized system trail (NO MTR) (not including CDNST segments)	20	20	20	20
CDNST Non-Motorized (closed to wheeled motorized vehicles)	19.3	19.3	19.3	18.0
CDNST open to wheeled motorized vehicles	24.6	20.6	22.5	21.9
CDNST located in an area open to over-snow motorized vehicles	8.0	12.0	10.1	12.0
CDNST located on State or County Jurisdiction	4.4	4.4	4.4	4.4

Table 2.9 Acres Open to Over-Snow Motorized Vehicles within Each IRA

Inventoried Roadless Area (IRA)	Total Acres of NF in Divide Planning Area	Alt.1 Existing Condition	Alt.2	Alt. 3	Alt. 4
Nevada Mountain	8,435	8435	7430	682	7430
Lazyman	11,503	0	0	0	0
Jericho Mountain	8,415	8415	4520	2418	2418
Electric Peak	27,851	9550	9550	9550	9550

Table 2.10 Miles Open to Wheeled Motorized Vehicles within Each Inventoried Roadless Area (IRA)

Inventoried Roadless Area (IRA)	Alt. 1 Existing Condition	Alt. 2	Alt. 3	Alt. 4
Nevada Mountain	2	0.07	0.01	0.07
Lazyman	0.08	0.08	0.08	0.08
Jericho Mountain	4.11	2.4	2.4	2.4
Electric Peak	7.2	4.93	0.08	0.49

The following table compares the segments of CDNST by mileage within the Divide Travel Planning Area with Alternative 1 being the No Action alternative in comparison to the action alternatives with the proposed designations for each segment.

Table 2.11 Alternative Comparisons of CDNST Segment Designations (miles)

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
337	0 to 3.623	Non-Motorized Trail (NM Trail)	3.623	3.623	3.623	3.623
136-D1	0 to 0.5	OHL	0.5	0.5	0.5	0.5
136-D1	0.5 to 2.508	OHL	2.008	0	0	0
136-D1	0.5 to 2.508	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	2.008	2.008	2.008
136	11.058 to 17.305	OHL	6.247	6.247	6.247	6.247
136	17.305 to 18.943	County Road	1.638	1.638	1.638	1.638
622	1.997 to 4.725	OHL	2.728	2.728	2.728	2.728
622	4.725 to 6.783	County Road	2.05	2.05	2.05	2.05
1855-C1	0 to 1.155	OHL	1.155	1.155	1.155	1.155
1855-B2	0 to 1.283	OHL	1.283	0	0	0
1855-B2	0 to 1.283	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	1.283	1.283	1.283
1855-B1	0.367 to 0.912	OHL	0.545	0	0	0
1855-B1	0.367 to 0.912	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	0.545	0.545	0.545
1854-A1	0 to 0.218	OHL	0.218	0.218	0.218	0.218
1854	0.593 to	OHL	0.064	0.064	0.064	0.064

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
	0.657					
337	22.064 to 23.107	NM Trail	1.043	1.043	1.043	1.043
1805-D3	0 to 0.145	OHL	0.145	0	0	0
1805-D3	0 to 0.145	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)		0.145	0.145	0.145
337	23.255 to 23.358	NM Trail	0.103	0.103	0.103	0.103
355-B2	0 to 1.8	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.8	1.8	1.8	1.8
335-B1	0 to 0.071	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0.071	0.071	0.071	0.071
1802-B2	0 to 2.041	OHL	2.041	0	0	0
1802-B2	0 to 2.041	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	2.041	2.041	2.041
1802-B1	0 to 0.046	OHL	0.046	0	0	0
1802-B1	0 to 0.046	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	0.046	0.046	0.046
1802	0 to 2.694	Roads open to highway legal vehicles 5/16-12/1 Open to over snow motorized vehicles 12/2 - 5/15 (03-RES)	2.694	2.694	0	2.694

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
1802	0 to 2.694	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	0	0	2.694	0
US 12	27.519 to 28.263	Highway	0.744	0.744	0.744	0.744
4197	0 to 0.613	Roads open to wheeled motorized vehicles 5/16-4/14 Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	0.613	0	0	0
4197	0 to 0.613	Roads open to highway legal vehicles 5/16-12/1 (03-Res) Open to over snow motorized vehicles 12/2 – 5/15 (03-Res)	0	0.613	0.613	0.613
337	31.316 to 34.500	NM Trail	3.184	3.184	3.184	3.184
1864	3.399 to 3.959	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	0.56	0.56	0.56	0.56
337	35.064 to 37.028	NM Trail	1.964	1.964	1.964	1.964
1856	4.108 to 5.979	Roads closed to wheeled motorized vehicles yearlong (06-Res) Open to over-snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.87	0	1.87	1.87
1856	4.108 to 5.979	Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	1.87	0	0
1836	0 to 1.274	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.274	1.274	1.274	1.274
337	40.188 to 41.019	NM Trail	0.831	0.831	0.831	0.831
495-B1	0 to 0.52	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1)	0.52	0.52	0.52	0.52

Route Number	CDNST Segment by Mile Marker	Designation	Alt. 1 Existing Condition (miles)	Alt. 2	Alt. 3	Alt. 4
		Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)				
495	4.191 to 10.688	OHL	6.49	6.49	6.49	6.49
337	48.038 to 56.94	NM Trail	8.902	8.902	8.902	8.902

Unauthorized Routes

As reflected in the summary of miles of motorized uses table above:

Under the No Action alternative, permissible motorized uses include those routes and areas not otherwise prohibited, including use of approximately 16 miles of unauthorized or use created routes.

Alternative 2, the Proposed Action, would designate approximately 10 miles of identified unauthorized routes that would be added to the Forest Transportation System. Any existing unauthorized routes not identified or included in this alternative would be considered closed.

Alternative 3 would designate approximately 9 miles of identified unauthorized routes that would be added to the Forest Transportation System. Any existing unauthorized routes not identified or included in this alternative would be considered closed.

Alternative 4 would designate 10 miles of identified unauthorized routes that would be added to the Forest Transportation System. Any existing unauthorized routes not identified or included in this alternative would be considered closed.

Access to Dispersed Campsites

Under the existing condition, Alternative 1, the 2001 Tri-State Decision allowed off-vehicle camping within 300 feet of roads and motorized trails; but, required visitors to select campsites by non-motorized means and access the campsites by the most direct route causing the least damage. Parking safely adjacent to a road or motorized trail within 30 feet from the edge of the road or motorized trail is also permitted under the existing condition.

Under Alternatives 2 and 3, parking safely adjacent to a road within 30 feet from the edge of the road or motorized trail would be allowed. In addition, wheeled motorized vehicle travel for camping or parking associated with camping would be allowed within 300 feet of designated system routes, including roads and trails (unless signed otherwise or specifically closed) as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

Access to dispersed camping is identified as an acceptable use in the planning area under the 2001 Tri-State Decision and the 2005 Travel Management Rule. Agency personnel have observed that, in general, this has occurred without causing unacceptable resource damage. Where site-specific issues have occurred, emergency closures were issued for resource protection. The Forest Service has this tool available when needed; therefore, the HNF is proposing to continue this practice under Alternatives 2 and 3.

Alternative 4 would permit wheeled motorized vehicle travel within 300 feet of designated system routes, including roads and trails (unless signed otherwise). It would allow motorized travel in this zone for legal recreational activities, in addition to camping and parking associated with dispersed camping. Legal recreation activities include, but are not limited to, parking, camping, big game retrieval, hiking, hunting, or firewood gathering. These activities would be allowed as long as:

- No new permanent routes are created by this activity,
- No damage to existing vegetation, soil, or water resource occurs,
- Travel off-route does not cross streams, and
- Travel off-route does not traverse riparian or wet areas.

CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter presents the relevant resource components of the existing environment – the baseline environment. It describes the resources of the area that would be affected by the alternatives. This chapter also discloses the environmental effects of implementing the alternatives. These form the scientific and analytical basis for comparing the alternatives described in Chapter 2.

Chapter 3 explains the basic components of the analysis followed by a section on each resource. This should provide the reader a better understanding of the overall motorized routes and designations for wheeled and over-snow motorized vehicles within the Divide travel planning area. Acre and mileage totals are approximate within tables and text due to rounding.

The purpose of this analysis is to compare alternatives, not to make predictions about the future. The analysis in this chapter focuses on the effects of the proposed changes to the current designated system. It does not analyze the effects of the whole designated system.

This DEIS looks at effects within the Divide Travel Planning area. The effects of proposed changes to the Divide Planning area were aggregated rather than describing the site-specific effect at each road or trail. For instance, specialist's reports describe the overall effects of reducing or allowing places people could drive instead of listing every route and predicting the effects at a particular site.

Most specialists used Geographic Information System (GIS) to calculate the miles and areas affected, or to model habitats. If specialists used models other than GIS, it would be described in their report.

It was assumed that motorized use would occur where it is proposed. In doing so, the effects analysis describes the effects resulting from the change between where people are currently driving (Alternative 1) and where people would drive (Alternatives 2 through 4).

Affected Environment

An effects analysis starts by describing the affected environment. As the name implies, this section describes those parts of the environment or project area that would change as a result of implementing the action alternatives. The CEQ describes it this way:

"The environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. The descriptions shall be no longer than is necessary to understand the effects of the alternatives." (40 CFR 1502.15).

In this project, the Helena National Forest proposes to close some roads and trails to motorized use, and prohibit driving off designated routes, with the exception of some proposed provisions for motorized travel within 300 feet of a designated route within the Divide Travel Planning Area. The affected environment, then, would relate to things that would change by opening or closing roads to wheeled motorized and over-snow vehicle travel, such as wildlife habitat and recreational opportunities.

Past Actions

The interdisciplinary team considered the effects of past actions as part of the existing condition. The current conditions are the sum total of past actions. The CEQ recognizes "agencies can conduct an adequate cumulative effects analysis by focusing on current aggregate effects of past actions without delving into the historical details of individual past actions" (Council on Environmental Quality 2005). Innumerable actions over the last century and beyond have shaped the Helena National Forest's current designated road system within the Divide travel planning area. Attempting to isolate and catalog these individual actions and their effects would be nearly impossible. By looking at current conditions, the effects of past human actions and natural events, regardless of which event contributed to those effects, are captured. Listing the past actions, however, can show trends. On balance, some past actions increased the amount of motorized use in the Divide Travel Planning Area, and others decreased it.

Environmental Consequences

The impact analysis and conclusions contained in this chapter were based on forest staff knowledge of the resources and site, reviewing existing literature and agency studies, information provided by specialists within the Forest Service and other agencies, and professional judgment. The methodology section for each resource describes additional specific data collection or analysis or other methods used for that resource.

Potential impacts in this chapter are described in terms of type (direct, indirect, cumulative and are the effects beneficial or adverse?); context (are the effects site specific, local, or regional?); duration (are the effects short term or long term?) and intensity.

The CEQ lists different kinds of effects that need to be analyzed under the NEPA:

- Direct effects are caused by the action and occur at the same time and in the same location as the actions that cause them.
- Indirect effects are caused by the action and are later in time or farther removed in distance, but still reasonably foreseeable.
- Cumulative effects are the sum of the incremental impacts from the action combined with other actions (past, present, and reasonably foreseeable future actions in or near the area). These are described in the next section.

Effects can be both beneficial and detrimental (40 CFR 1508.8). For example, this travel management project, closing roads to motorized use could improve wildlife habitat (beneficial effect for wildlife species) and reduce the amount of motorized recreational opportunities (detrimental impact to riders).

The regulations do not require agencies to separate the direct and indirect effects, so in this document we describe them together by resource. Cumulative effects have their own section by resource.

For the purposes of this analysis, short-term effects are those expected within the next 1 to 10 years (throughout the course of project implementation) and long-term effects are those that are expected between 10 and 20 years or more (after implementation is complete) unless specifically defined in individual resource sections that follow.

Cumulative Effects

The definition of cumulative impact according to the CEQ is:

" 'Cumulative impact' is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7).

To be cumulative, effects must overlap in space and time. Cumulative impacts are important because they could cause a tipping point, either beneficial or detrimental. To analyze cumulative effects, the interdisciplinary team looked at the effects from this proposal and added them to the effects from past, present, and reasonably foreseeable future actions.

Reasonably Foreseeable Actions

Courts have interpreted a "reasonably foreseeable future action" as one that has been proposed and is in the planning stages. To analyze the cumulative effects of present and reasonably foreseeable future actions, each resource specialist looked at the list of projects in Appendix B. They identified the ones expected to cause effects to their resource, at the same time and in the same place as effects from the proposed action or alternatives. Some specialists analyzed additional actions that pertained only to their resource.

Consistency with Adjacent National Forest Travel Management Planning

The southwest corner of the Divide Travel Plan on the Helena National Forest (HNF) area shares a common boundary with the Beaverhead-Deerlodge National Forest (B-D NF). This boundary includes the Electric Peak Inventoried Roadless Area and the Kading/Limburger Springs area located on the HNF. Please see the map below.

The Electric Peak Inventoried Roadless Area is located on both the Helena and Beaverhead Deerlodge National Forests area and is identified as recommended wilderness in both Forest Plans. Proposed Travel management for this area is consistent in all four alternatives for the Divide Travel Plan and coincides with current management direction on the adjacent B-D NF.

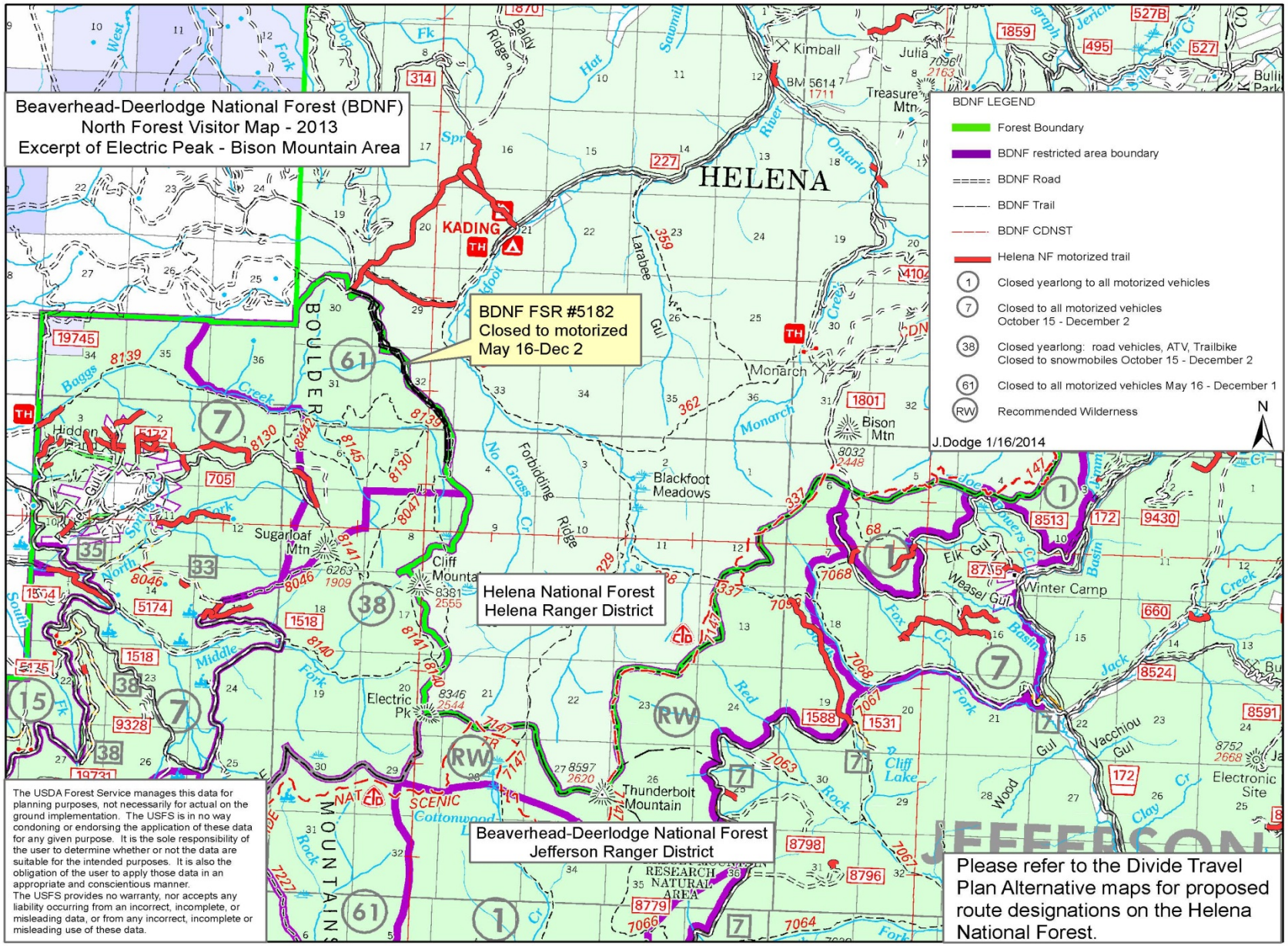
The HNF Kading Grade/Limburger Springs area is also adjacent to the B-D NF. Over-snow vehicle management for this area is consistent with the B-D NF with both areas being open to over-snow motorized vehicle use. The adjacent lands administered by the B-D NF are closed to over-snow motorized use from 10/15 through 12/1, which is consistent with Divide Alternative 1. Divide Alternatives 2 through 4 propose closure to over-snow motorized use from 5/16 through 12/1 for resource protection.

However, proposed wheeled motorized use for the Kading/Limburger Springs area varies in the Divide Travel Plan between the four alternatives and is intended to be consistent with adjacent management on B-D NF. Those variations are described in further detail below. Motorized Trail 502 located within the Divide Travel Plan, connects to B-D NF Forest System Route (FSR) 5182 which would be managed as a non-motorized route from October 15 to December 1 and non-motorized trail 8130. (Please refer to the map on the following page in addition to the Divide alternative maps.) The variations are as follows:

- Alternative 1 (No Action/Existing Condition): Motorized trail route (MTR) 502 located within the Kading/Limburger Springs area connects the HNF to the neighboring B-D NF

Route 5182. MTR 502 is open to wheeled vehicles 50” or less in width from May 16 to October 14.

- Forest System Route 1868, located on the HNF, also connects to BD NF route 5182. FSR 1868 is currently open to wheeled motorized vehicles June 1 through August 31. The B-D NF closed Route 5182 to motorized vehicles from May 16 through December 2 under their 2010 Forest Plan Revision. As a result, these two routes are not consistent with the B-D NF travel management system where routes from the HNF connect to FSR 5182 located on the B-D NF.
- Alternative 2: Management of the wheeled motorized routes in the Kading/Limburger Springs Area would remain the same as Alternative 1. However, FSR 1868 would only be open to wheeled motorized vehicles 50” in width and less from May 16 through October 14. The B-D NF closed Route 5182 to motorized vehicles from May 16 through December 2 under their 2010 Forest Plan Revision. Similar to Alternative 1, these two routes are not consistent with the B-D NF travel management system where routes from the HNF connect to FSR 5182 located on the B-D NF.
- Alternatives 3 and 4: MTR-502, and FSR 1868 would be closed to wheeled motorized vehicles year-long and would be consistent with the B-D NF.


Beaverhead-Deerlodge National Forest (BDNF)
North Forest Visitor Map - 2013
Excerpt of Electric Peak - Bison Mountain Area
BDNF LEGEND
Forest Boundary
BDNF restricted area boundary
BDNF Road
BDNF Trail
BDNF CDNST
Helena NF motorized trail
Closed yearlong to all motorized vehicles
Closed to all motorized vehicles October 15 - December 2
Closed yearlong: road vehicles, ATV, Trailbike Closed to snowmobiles October 15 - December 2
Closed to all motorized vehicles May 16 - December 1
Recommended Wilderness
N
J.Dodge 1/16/2014
BDNF FSR #5182 Closed to motorized May 16-Dec 2
Helena National Forest Helena Ranger District
Beaverhead-Deerlodge National Forest Jefferson Ranger District
HELENA
KADING
Kimball
Julia
Treasure Mtn
Monarch
Bison Mtn
Blackfoot Meadows
Sugarloaf Mtn
Cliff Mountain
Electric Pk
Thunderbolt Mountain
Winter Camp
Cliff Lake
Electronic Site
Hidden
BOULDER
MOUNTAINS
JEFFERSON
The USDA Forest Service manages this data for planning purposes, not necessarily for actual on the ground implementation. The USFS is in no way condoning or endorsing the application of these data for any given purpose. It is the sole responsibility of the user to determine whether or not the data are suitable for the intended purposes. It is also the obligation of the user to apply those data in an appropriate and conscientious manner.
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Please refer to the Divide Travel Plan Alternative maps for proposed route designations on the Helena National Forest.

Specialist Reports

Relevant resource components from each resource specialist's report are highlighted in this chapter. Components include the existing environment which is the baseline environmental condition as described under Alternative 1 (No-Action), and the anticipated environmental effects of implementing the range of alternatives. Please see Appendix A for Forest Plan consistency for each resource.

This DEIS incorporates by reference the Resource Specialist Reports in the Project Record (40 CFR 1502.21). These reports contain the detailed data, executive summaries, regulatory framework, assumptions and methodologies, analyses, conclusions, maps, references, and technical documentation that the resource specialists relied upon to reach their conclusions. These reports are summarized in this chapter.

The specialists reports for Lands/Rights of Way and Minerals have not been included in this document as they did not generate concerns from the public, would not be affected by the actions, and would still meet Forest Plan consistency requirements. These resource reports have been filed in the project record and are available for review upon request.

Amendment to the Helena National Forest Plan

A proposed programmatic plan amendment to the "Helena National Forest Plan" (Forest Plan) is a component of this analysis as described in Chapter 2 and Appendix D. By law, the proposed actions must be consistent with the Forest Plan or the Plan must be changed. Amendments to the Forest Plan can have effects because they propose changes in the management of the forest.

Project Record

The Divide Travel Plan Project Record is referenced throughout this document in an effort to keep this document brief and concise as per 40 CFR 1502.21. The Project Record contains a variety of documents, including, but not limited to: specialists' reports, literature, supporting documents, and other process-related documents.

RECREATION

Regulatory Framework

The Divide Travel Management Plan analysis and decision is made in accordance with regulations, direction and policy. The increased popularity and widespread use of Off-Highway Vehicles (OHVs) on public lands during the 1960's and early 1970's prompted development of unified federal policy that started with executive orders (EO) 11644 in 1972 and EO 11989 in 1977. Forest Service (FS) regulations, created to implement the above EO and govern the forest transportation system, are located in the 36 Code of Federal Regulations (CFR), Part 212.

Forest Service recreation management is guided by a *Recreation Opportunity Spectrum* (ROS), which provides the basic framework for inventorying, planning, and managing recreation resources in accordance with the Forest and Rangeland Resources Planning Act of 1974 (RPA), as

amended by the National Forest Management Act of 1978 (NFMA). ROS is a conceptual scheme that identifies seven categories which represent a mix or combination of recreational activities, settings, and experience opportunities along a spectrum from Primitive to Urban. In addition, this report was developed by the principle elements from the Council on Environmental Quality (40 CFR parts 1500-1508).

Forest Plan

The Forest Plan (1986) directs management of all federal lands within the Divide travel planning area. It establishes Forest-wide goals, objectives, and management area (MA) direction for multiple uses of the renewable resources as well as standards and guidelines to assure sustained land productivity and environmental protection.

The Forest Plan states that most existing roads would be left open. It further states generally, the Helena National Forest would be open to vehicles except for roads, trails or areas which have restrictions. Forest-wide goals and objectives, pages II/1 and II/6 of the Forest Plan, discuss how roads and trails will help to meet Forest land and resource objectives and visitor needs. Other Forest-wide resource goals and objectives identify how the transportation system can help meet those needs. Forest-wide goal #15 on page II/2 in the Forest Plan directs development and implementation of a road management program with road uses and travel restrictions that are responsive to resource protection and public concerns.

The Helena National Forest has been divided into 23 management areas each with different management goals, resource potential and limitations. Travel plan decisions will be made in accordance with established goals and standards of each management area.

Forest Plan Amendment #20, derived from the 2001 Tri State OHV Record of Decision (ROD), allows wheeled motorized use on existing open routes or areas with all other National Forest System lands restricted from off-route motorized use. (reference section below)

Management policy and direction is also provided in Forest Service Manuals (FSM) and Handbooks (FSH). In particular, FSM 7700 (Travel Management) and FSM 2300 (Recreation, Wilderness and Related Resource Management) provide specific direction related to the management of Forest Service roads and trails.

Forest Service/BLM Off-Highway Vehicle Record of Decision 2001 (2001 Tri State OHV ROD)

In January 2001, the Forest Service (FS) and Bureau of Land Management (BLM) issued a joint off-highway vehicle decision which facilitated amendment #20 of the Helena Forest Plan. This decision restricted wheeled motor vehicles to existing roads, trails and designated areas; however, it allows motorized travel to access dispersed campsites up to 300 feet off existing motorized routes. The 2001 Tri-State OHV Decision also directed National Forests to establish a schedule for completing site-specific travel planning that would designate appropriate uses on all system and non-system roads and trails.

Until site-specific planning is accomplished, the OHV amendment restricts wheeled motorized vehicles to routes that existed prior to 2001. The OHV amendment provides guidance on motorized use extending from 4-wheel drive routes to single track motorcycle trails.

Travel Management Rule of November 2005 (2005 Travel Rule)

Federal Regulations identified in 36 CFR parts 212 and 295 were combined and clarified as 36 CFR part 212 under the *Travel Management Rule; Final Rule of November 2005*. The 2005 Travel

Rule requires National Forests to designate those roads, trails and areas that are open to motor vehicle use on National Forest System (NFS) lands. The final rule prohibits the use of wheeled motor vehicles off the designated system. As a result, individual Forests are required to conduct a site-specific analysis to determine the designated motorized route system and areas (36 CFR, Part 212, Sub-part B).

CDNST Comprehensive Plan

On October 2, 1968 Congress enacted the National Trails System Act which established a nationwide trail system. On November 10, 1978 Congress amended the National Trails System Act to establish and designate the CDNST. The Continental Divide Trail Comprehensive Plan was approved by the Chief of the Forest Service in 1985. The U.S. Forest Service goal of the Comprehensive Plan was to provide a uniform Trail Management Program, which reflected the purposes of the National Scenic Trail System, and at the same time allowed for the use and protection of the natural and cultural resources found along the designated route on lands of all jurisdictions. In an effort to clarify the Comprehensive Plan Direction, the Deputy Chief of the Forest Service sent correspondence to Regional Foresters in 1997 that stated, "as the CNSDT is further developed, it is expected that the trail will eventually be relocated off of roads for its entire length". That memorandum further stated, "it is the intent of the Forest Service that the CDT will be for non-motorized recreation". CDT segments can be open to motorized use but only in limited situations and based upon specific criteria.

Additional direction for the CDNST was also provided in a Forest Service Manual Amendment (dated October 6, 2009). It provided the following guidelines applicable to this travel plan analysis which should be considered.

(1) Manage the CDNST to provide high-quality scenic, primitive hiking and pack and saddle stock opportunities. Backpacking, nature walking, day hiking, horseback riding, nature photography, mountain climbing, cross-country skiing, and snowshoeing are compatible with the nature and purposes of the CDNST (FSM 2353.42). Use the Recreation Opportunity Spectrum (ROS) and the ROS Users Guide in delineating and integrating recreation opportunities in CDNST unit plans and managing the CDNST (FSM 2311.1). Where possible, locate the CDNST in primitive and semi-primitive non-motorized ROS classes to provide for continuous travel between the Montana-Canada and New-Mexico-Mexico borders. Locate a CDNST segment on a road only where it is primitive and offers recreational opportunities comparable to those provided by a trail with a Designated Use of Pack and Saddle Stock, provided that the CDNST may have to be located on or across designated routes because of the inability to locate the trail elsewhere (FSM 2353.44b, paragraph 11).

(2) Motor vehicle use by the general public is prohibited on the CDNST, unless that use is consistent with the applicable CDNST unit plan and:
   (a) Is designated in accordance with 36 CFR Part 212, Subpart B and:
      (1) The designated vehicle class and width were allowed on that segment of the CDNST prior to November 10, 1978, and the use will not substantially interfere with the nature and purposes of the CDNST (FSM 2353.42) or
      (2) The designated segment was constructed as a road prior to November 10, 1978; or

(b) In the case of over-snow vehicles, is allowed in accordance with 36 CFR Part 212, Subpart C, and the use will not substantially interfere with the nature and purposes of the CDNST (FSM 2353.42).

Assumptions

Under all three action alternatives, existing snowmobile routes located on Forest roads would be closed to wheeled motorized vehicles when they are groomed.

The Divide travel plan decision will include only open or closed determinations – no decommissioning measures will be specified in this decision.

Any route designated 06; closed year-long to wheeled vehicles, may potentially be fully decommissioned in a separate NEPA analysis and decision.

Any existing route not identified as a HNF system route in this travel plan decision would be considered a non-system route and would be available for decommissioning.

OHV refers to all wheeled motorized vehicles 50" and less in width.

Undetermined roads and trails are the same as unclassified, unauthorized and/or user created, the terms are interchangeable. While these routes are not part of the National Forest System routes, as per the 2001 Tri-State OHV Decision, if a route was on the ground prior to 2001, it needs to be recognized as existing until a site-specific analysis is complete to determine if it should be incorporated into the National Forest System. This travel plan is a site-specific plan that will analyze the various undetermined roads and trails and determine if the route should be incorporated into the National Forest road and/or trail system or decommissioned as per the Tri-State Decision.

Information Used

Existing road and trail information was acquired from the Helena National Forest Transportation System in addition to Forest Service employee field observations, input from the public and user groups. This information coupled with GIS data was obtained to provide spatial information about designated system roads, trails, Inventoried Roadless Areas, and the Recreation Opportunity Spectrum to reflect the existing motorized roads and trails for analyzing as per the 2001 Tri-State Decision.

Recreation use information has been obtained from a variety of sources. Research papers, publications, and survey information relative to trends or estimated use was acquired for this analysis through the documents identified below. It should be noted that information referenced is not specific to the Divide Travel Management Area. The Helena Forest does not generally obtain or document visitor use except at developed recreation fee sites.

- National Visitor Use Monitoring Results FY 2008 for Helena National Forest
- Outdoor Recreation In America 2000 (Addressing Key Societal Concerns) by Roper Starch
- Off-Highway Vehicle Use on National Forests: Volume and Characteristics of Visitors (5 August 2004)
- Off-Highway Vehicle Recreation in the United States, Regions and States (June 2005) by USDA Southern Research Station
- Montana Tourism & Recreation Strategic Plan 2008 – 2012
- Statistics from the Department of Justice: Title & Registration Bureau
- Recreation Facility Analysis, Helena National Forest (2008)
- Recreation on Federal Lands, Congressional Research Service (February 25, 2009)

- Roads Analysis Report; Helena National Forest (2002-20004)
- 2008 Helena National Forest Recreation Facility Analysis

Information was also gathered from past and current travel plan efforts on the Helena National Forest. In 2008, the Forest received over 300 comments in response to the Divide Travel Proposal. This input was utilized to document public opinion about travel in the Divide Area and to develop additional alternatives.

Methodology and Scientific Accuracy

Data was gathered to describe the existing condition and for use as baseline information to analyze direct, indirect and cumulative effects among the alternatives.

NEPA effects analysis is both quantitative and qualitative. The status of available road and trail miles provides a quantitative view of project effects by alternative. The extent of effects on travel routes and other recreation opportunities is necessarily a qualitative assessment based on past forest visitor patterns, historical trends and the experience of the recreation specialists completing this analysis.

Recreation, Affected Environment

Introduction

The popularity and use of OHVs in Montana and the Helena area continues to increase, as is evidenced by the number of those vehicles observed on the National Forest. With the exception of one year (2000), the number of registered OHVs in Montana increased annually from 1990 through 2008.

Motorized use of public roads and trails in the Divide Travel Area is an important recreation activity for many. Motorized use is also an important administrative tool for: livestock management, spraying noxious weeds, minerals management and vegetation management. The perceived “best” allocation of recreation opportunities in the analysis area, including motorized travel, varies with the backgrounds, interests, and personal biases of different forest users.

Analysis Area

The analysis area consists of National Forest System lands in the Divide Travel Management Area. This includes approximately 155,480 acres of public land located in Lewis & Clark and Powell counties. The area encompasses Black Mountain and extends from the Tenmile drainage west to the Little Blackfoot and Bison Mountain area.

The Divide Travel Area, located on the Helena Ranger District, is popular for recreation throughout the year. This is due in large part to the proximity of local communities in Helena, Elliston, Avon, Montana City, and Clancy.

Forest roads provide important access for and to a variety of recreation opportunities. Many forest visitors are primarily interested in viewing scenery and wildlife from the comfort of their vehicles. For others, roads provide access for hunting, camping, hiking, fishing and a variety of other recreation activities. Some of the existing national forest roads within the Divide Travel Area are maintained routinely and provide motorized vehicle access. However, other roads are not maintained to passenger vehicle standards and require high clearance vehicles.

The Divide Travel Area is a popular area for winter recreation, especially over-snow vehicle use. Designated snowmobile parking within the Divide travel planning area is located at Moose Creek, Sweeny Creek, Mullan Pass, Austin and the Little Blackfoot. The "Helena Snowdrifters" snowmobile club maintains and grooms snowmobile trails during the winter months. There is also a designated parking area that accesses approximately 10 miles of cross-country ski trails located on the east side of MacDonald Pass. The existing trail network is maintained primarily through the volunteer efforts of the Last Chance Nordic Ski Club.

Upland bird hunting, bow hunting and big game hunting season are also very popular with local residents during the fall months. It is not uncommon for hunters to camp at some of the dispersed camping sites within the planning area.

Popular recreation opportunities during the summer and early fall include: fishing, hiking, camping, horseback riding, OHV use, mountain biking and picnicking.

Overnight camping is very popular at the District's developed campgrounds in addition to numerous undeveloped sites within the Divide Travel Area. Most of the frequently used dispersed campsites are located adjacent to a river or stream including: Tenmile Creek, Telegraph Creek, and Little Blackfoot River. In many areas, impacts associated with dispersed camping are acceptable and limited to soil compaction, sanitation, and litter. However, in several locations resource conditions at the campsites and/or access routes are badly degraded and require rehabilitation. Currently, off-route wheeled motorized travel up to 300 feet is allowed to access dispersed campsites, unless specifically prohibited.

Several developed recreation sites are located on the Helena Ranger District within the Divide Travel Area. There are two trailheads located on MacDonald Pass: one for the cross-country ski trails and another for the Continental Divide National Scenic Trail (CDNST). Also located on the top of MacDonald Pass is the 15 unit Cromwell Dixon Campground. East of the divide are several developed sites located along the Rimini Road. Moose Creek Campground, Ten Mile Day Use Area, Moose Creek Winter Trailhead, and Moose Creek Rental Cabin are all located within a short distance of each other and comprise the recreation complex in the Tenmile drainage. There are also developed sites located west of the divide near the Little Blackfoot River: Kading Cabin and Kading Campground.

Special Use Permits

In addition to the public recreation sites there are two residence tracts that have privately owned cabins located on National Forest lands within the Divide Travel Area that are authorized under terms of a special use permit. The Moose Creek Villa Tract is located along the Rimini Road and consists of five recreation residences. The Forest Heights Tract, near the top of MacDonald Pass, has seven permitted recreation residences. Forest Heights contains two separate roads to provide access to the recreation residences, and are only open to authorized cabin permit holders. Permittees cannot use their cabin as a permanent residence and are restricted to use of their site less than six months per calendar year.

The Forest also administers a special use permit to the Prickly Pear Sportsman's Association for a target range located east of MacDonald Pass which is utilized year-long.

West of the divide, along the Little Blackfoot River, is the Lion's Sunshine Camp that is authorized under the organizational camp authorities to the Helena Lion's Club. Use of the Sunshine Camp occurs primarily from May through September.

Designated system trails are also located within the Divide Travel Area. With the exception of over-snow use, none of the trails are managed for motorized travel. All system trails are closed to wheeled motorized use with the exception of two short segments of the Continental Divide National Scenic Trail (see CDNST information below). Non-motorized trails within the analysis area include: Bison-Blackfoot Trail #328, Blackfoot Meadows Trail #329, Continental Divide Trail #337, Switchback Ridge Trail #348, Larabee Gulch Trail #359, Monarch Creek Trail #326, Cave Gulch Trail #371, and Ten Mile Environmental Trail #375.

Little Blackfoot Road #227 ends at a turn-around approximately ¼ mile south of Kading Cabin. At that location an un-improved native surface road (#227-E1) extends approximately 1 mile south to the Kading Grade and the termini of the Blackfoot Meadows Trail #329. Road #227-E1, which contains several large mud holes, is only accessible by high clearance vehicles. Observations by Forest employees suggest less than 50% of visitors who use Trail #329 drive vehicles to the end of Road #227-E1. There is existing non-system trails located west of Forest Road #227. Because these routes existed prior to 2001 they remain open to motorized vehicles (seasonally). Motorized routes #501, #502, #503 and #504 are open to vehicles less than 50 inches in width from May 16th through October 14$^{th.}$ These non-system trails have become increasingly more popular with individuals camping at Kading Campground and the dispersed sites adjacent to the Little Blackfoot River.

The Forest Plan identified several management areas which consist of large blocks (greater than 3,000 acres) of undeveloped land suited for dispersed recreation. One of those R1 management areas (Mount Helena) is located within the Divide travel planning area. Portions of T9N, R4W, Section 16, 17 and 20 receive minimal recreation use as there are no designated roads or trails in this area.

In an effort to obtain visitor use information the U.S. Forest Service initiated a national visitor use monitoring project (NVUM). The information collected by this project is valid and applicable at the forest, regional, and national level.

A growing trend through much of the Helena National Forest, including the Divide travel area, is the construction of new residences on private in-holdings. Occupancy of private homes in and adjacent to the Divide Travel Area impacts recreation use on National Forest lands. People residing within the National Forest boundary often use adjacent National Forest lands for their recreation activities. As a result, recreation use has increased in certain locations including the Little Blackfoot River and Telegraph Creek corridors, and Sweeny Creek area. In addition, residents that live adjacent to the National Forest are usually concerned about management activities which occur nearby. Forest management and public recreation use can and frequently does impact adjacent homeowners who moved to a rural setting to get away from people and their influences. The increased influx of residents within the Forest boundary has created on-going conflicts in some locations, specifically the Sweeny Creek Area.

In the mid-1990s the Helena National Forest designated special areas for hunters with disabilities. That opportunity allowed qualified individuals with disabilities to hunt from roads that were otherwise closed to motorized travel. The practice was discontinued after several years due to conflicts and mixed public opinion. One of the areas included in the “Hunter Access Program” was the Hahn Creek Road (#1856) segment located behind a locked gate. Although that opportunity is no longer available on the Helena National Forest, employees still receive numerous requests to provide special motorized opportunities for the elderly and individuals with disabilities, especially during the big game hunting season. In addition, people also request designation of game retrieval routes in many areas which are not currently provided.

The area within the Divide travel plan offers opportunities for both motorized and non-motorized recreation across the Recreation Opportunity Spectrum (ROS). As stated under the Regulatory Framework section, the ROS provides the framework for inventorying, planning and managing the recreation resource. The distribution of the ROS classes in the Divide Travel Area is outlined in the table below. The travel plan area predominately falls into the Roaded Natural, Semi-primitive Motorized, and Semi-primitive Non-Motorized categories due to past and current development, such as roads and associated timber harvest, within and near the analysis area. The largest tracks of semi-primitive non-motorized areas are the Inventoried Roadless Areas.

Table 3.1 Summer ROS Distribution in the Divide Travel Management Area: 2009

Category	Acres	%
Semi-primitive Non-motorized	30,620	20%
Semi-primitive Motorized	28,532	18%
Roaded Natural	78,120	50%
Roaded Modified	15,260	10%
Rural	2,960	2%
Total	155,483	100%

Recreation Issues of Concern

Past travel plan analysis and public scoping identified several key issues specific to the Divide Travel Area. Key emphasis issues and/or areas included: Motorized Use; the Continental Divide National Scenic Trail; Sweeny Creek Area; and Kading Area.

Motorized Use

It is very unlikely that forest visitors would travel long distances to seek motorized recreation opportunities in the Divide Travel Area. Because potential motorized opportunities in the Divide Travel Area are minimal, effects analysis will be limited to those applicable to the Helena National Forest.

Approximately 286 miles of designated roads within the analysis area are currently open to highway legal vehicles year-long. In contrast, there are 85 miles of Forest roads that are closed to all motorized vehicles year-long, including over-snow machines. The remaining 42 miles of road (not including county roads) within the analysis area are closed year-long to wheeled motorized travel but open to over-snow vehicles from December 2nd through October 14th. It's important to note that most Forest roads provide motorized access to a variety of recreation opportunities.

Of the approximately 85 miles of Forest roads closed to all motorized vehicles year-long, the areas adjacent to approximately 74 miles of these roads are currently open to over-snow vehicles. While it is currently illegal to operate an over-snow vehicle on these roads, it is perfectly legal to operate over-snow vehicles adjacent to the road prism. This has presented re-occurring management problems on the Forest, especially travel violations.

The Divide Travel Area also contains approximately 140 miles of designated snowmobile trails. About 100 miles are regularly groomed and the other 40 miles are groomed occasionally. The majority of snowmobile trails in this area are located on existing roads. A current travel restriction, applicable within the analysis area and throughout the Helena Ranger District, prohibits wheeled motorized vehicles over 50 inches wide from operating on designated snowmobile trails when they are groomed. In addition, snowmobiling also occurs on National Forest lands within the Divide Travel Area which are open to that use. Currently there are about 122,844 acres that are open to snowmobiling with no or only seasonal restrictions. This equates to approximately 79% of the total National Forest acres in the analysis area. As stated above, a current and unresolved travel restriction issue is the presence of Forest roads which are closed to over-snow vehicle travel located within areas open to that use.

Currently the Divide travel planning area does not have any designated wheeled motorized trails identified on the Forest Transportation Inventory. However, there are approximately 12 miles of trail that are currently open year-long to wheeled motorized vehicles 50" in width or less. There are also 7 miles of trail that are open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th. In addition, there about 16 miles of unauthorized roads and trails open to wheeled motorized travel.

The 7 miles of trail noted above, occur on routes that were in existence prior to 2001. Wheeled motorized vehicle use occurs on the following routes near Kading Campground: Road-501, MTR-502, MTR-503 and MTR-504 (please see the Kading Area discussion below).

A popular area for off-highway vehicle use is Sweeny Creek. While use is currently managed in accordance with the Tri-State OHV Decision, there are concerns about the amount and type of motorized use occurring in the Divide travel planning area and the associated impacts.

Although not formally documented, there are routine travel plan violations which occur in some areas. Located near Bison Mountain, NFSRs 1801-A1 and 1801-A3 are closed to over-snow motorized vehicles but continue to receive that use each winter. Those roads (once part of the CDNST) provide access to trails on the Beaverhead-Deerlodge National Forest.

Additionally, OHV's which are allowed on the Kading Grade from May 16th through October 14th also travel onto adjacent lands on the Beaverhead-Deerlodge National Forest which are closed to wheeled motorized travel.

Continental Divide National Scenic Trail

The Continental Divide Trail (CDNST), which extends through the Divide Travel Area, is nationally designated and recognized as an important recreation destination/opportunity. Travel planning in the analysis area may provide an opportunity to make CDNST travel decisions which would move the Helena Forest toward greater compliance with national direction for the trail. The current route on the Helena Ranger District extends approximately 56 miles from Nevada Mountain south to Thunderbolt Mountain. This portion of the CDNST is a combination of individual segments that are located on: jeep trails, single track trails, county roads, private roads, open Forest Service roads and roads closed to motorized travel. The CDNST on the Helena Ranger District consists primarily of roads (52 miles, all of which are in the planning area). About 19 miles of the existing CDNST road segments are closed to wheeled motorized travel. The CDNST is also comprised of several single track trail segments totaling approximately 4 miles in length. Although these single track trail segments are not managed for motorized use, that use is not prohibited. Due to the various locations of route segments and intersections it can be extremely difficult to follow the CDNST through the Helena Ranger District. Popularity

and use of the CDNST on the Helena Forest is growing, both locally and with visitors who seek to travel longer segments of the trail. See CDNST map in the map packet at the end of the document.

Sweeny Creek Area

The Sweeny Creek Area has been identified through public input (both written and verbal) as a specific area of concern. That area is adjacent to the Forest boundary and a growing number of privately owned homes. As a result, Sweeny Creek is important to local residents who recreate in that location and/or may be impacted by others recreating there. For many years the area provided recreation opportunities for: hiking, picnicking, camping, folfing (Frisbee golf), group use, nature study, and hunting. During the past ten years the Sweeny Creek Area has grown increasingly popular for OHV use (ATVs and trail bikes), paint ball activities, mountain biking and horseback riding. Increased recreation use has displaced some recreationists and raised concerns with local residents about unacceptable resource and social impacts. In particular, residents have expressed frustration with the noise, dust, vandalism, litter, loss of vegetation and soil erosion that is occurring as a result of some recreation activities.

Wheeled motorized vehicles are used on constructed roads and other routes within the Sweeny Creek area. Those routes are designated as motorized trails (MTR) on Alternative Maps 1 and 2: MTR-001, MTR-004, MTR-008, MTR-011, MTR-016, MTR-017, MTR-018 and MTR-021. Other routes in the Sweeny Creek area were not carried forward in any of the alternatives as they didn't meet the definition of a route as per the 2001 Travel Decision. Twenty years ago motorized use on the Sweeny Creek routes was limited to an occasional high clearance vehicle and motorized trail bikes. With the increased popularity of OHVs, motorized use in Sweeny Creek has greatly expanded. It's a popular location for motorized use during the spring because it is snow-free earlier than many other areas on the Forest. While existing travel restrictions mandate wheeled motorized use on existing routes only, violations frequently occur and result in new unauthorized routes and resource damage. The Helena Forest Plan identified most of the Sweeny Creek area as Management Area (MA) T-1 or M-1. An identified management standard for MA T-1 states, "controls on motorized recreation will be implemented where necessary to protect the vegetation, soil, and water resources and to prevent road damage". Although the Sweeny Creek Area is open to over-snow vehicles, that use is limited due to the lack of a consistent snow base.

Kading Area

The Kading Grade was once a popular route providing motorized access from the Helena National Forest to private lands and the Beaverhead-Deerlodge National Forest. Motorized use on the Kading Grade route has declined. In addition, National Forest lands west of Kading Grade have been closed to OHV use, with the exception over-snow vehicles. NFSR 1868, Kading Grade (MTR-502) and routes 501, MTR-503, and MTR-504 are currently open to wheeled motorized vehicles from May 16th through October 14th. With the exception of the winter season, these routes are primarily used by wheeled motorized vehicles from the middle of summer through the fall hunting season.

Recreation, Environmental Consequences

Effects Common to All Alternatives

Because this is strictly an open or closed decision, future travel decisions would be necessary for actions such as: road or trail re-location, route obliteration, and new road or trail construction. Implementation of any travel plan alternative may result in the displacement of an undetermined number of Forest visitors. There may be limited visitor displacement if Alternative 1 or 2 are selected because that motorized use currently exists. However, if Alternative 3 or 4 is selected, motorized enthusiasts currently using some routes could be displaced to other areas on the Helena Forest.

There would continue to be increased public demands for both motorized and non-motorized opportunities. Although it's impossible to predict future economic conditions or social trends, there is an existing demand for more motorized opportunities and additional areas which provide semi-primitive non-motorized recreation.

As per the Tri-State OHV decision site-specific planning at the local level would identify when and where individual roads and trails would be open and closed to various types of use, implementation of any alternative would result in the designation of motorized routes within the Divide Travel Area. Through this decision unauthorized routes would either be closed to motorized travel or added to the Forest transportation inventory.

No motorized routes were designated solely for use by individuals with disabilities during the big game hunting season.

None of the alternatives would facilitate a large motorized trail network sought by some recreationists. Wheeled motorized travel would be restricted to existing routes designated for that use. Off-route travel by wheeled vehicles would be authorized for parking adjacent to existing roads. Wheeled off-route travel would also be allowed to access dispersed campsites but only within 300 feet of open roads/trails and only by taking the most direct route which does not result in resource damage.

The U.S. Forest Service recognizes that vehicles emit greenhouse gases that contribute to global climate change; however, this project does not determine "if" motorized activity occurs within the Divide Travel Area but rather where it may occur. We have seen no evidence to indicate that the general public would meaningfully alter the amount of their motorized use because of the designation of routes on National Forest lands, whether their preferred use is to drive to a trailhead to hike, tour in a passenger vehicle, or to recreate with off-highway vehicles on or off the Forest. Under the action alternatives, fewer routes would be available for motorized use than are currently authorized, but there is no indication that would result in a different amount of motorized use by the general public.

Effects Common to All Action Alternatives

Although new travel restrictions would be less complex and more easily understood, changes would require a period of adjustment for Forest visitors. A change in travel restrictions may initially result in increased violations.

Alternative 1, No Action

Direct and Indirect Effects

Recreation access and opportunities would remain much as they currently exist.

This alternative would not designate any roads that would be open to wheeled motorized vehicles solely during the big game rifle season.

The use of motorized vehicles in some locations may have already displaced some Forest visitors who seek quiet recreation opportunities.

Approximately 16 miles of existing unauthorized routes currently used by motorized vehicles would be added to the Forest transportation inventory.

Motorized access on NFSR #227-D1 would provide limited wheeled motorized vehicle access (with a ford across the Little Blackfoot River) to a trailhead and Miller Cabin in Larabee Gulch. The existing ford is not safe for vehicle travel during most of the year. Although there is no road bridge across the Little Blackfoot River, the short spur road east of the river is currently open to motorized travel.

Motorized Use

The existing non-system motorized routes located in the Kading area would be authorized as designated motorized trails open from May 16th through October 14th. Designation of those routes would result in a need for routine maintenance and possibly reconstruction. These routes would be signed and maintained as system trails. It is reasonable to assume that improvements to those routes would increase motorized use.

Under this alternative approximately 16 miles of existing but non-system routes would remain open to wheeled motorized travel. These routes would need to be added to the Forest transportation system as roads or trails.

Wheeled motorized trails in the Kading area would continue to be restricted from use October 15th through May 15th. This area is currently open to wheeled motorized travel from May 16th through October 14th which could impact bow season and early fall hunting opportunities. For others, the wheeled motorized access offers motorized recreation opportunities. Motorized over-snow travel would remain prohibited on approximately 71 miles of existing Forest roads but would be allowed on land adjacent to those roads

Table 3.2 Miles of Motorized Travel Routes Under Alternative 1

Route Type	Miles
Roads Open to Hwy Legal Vehicles (No Restrictions)	286
Roads Closed to All Motorized Vehicles (Year-long)	85
Roads Closed to Wheeled Motorized Vehicles (Year-long). Open to Over-Snow Vehicles (12/2 – 10/14)	42
Trails Open to Vehicles 50” or Less (No Restrictions)	12
Trails Open to Vehicles 50” or Less (5/16 – 10/14)	7
CDNST Non-Motorized (Closed to Wheeled Motorized	19.2

Route Type	Miles
Vehicles)	
CDNST Open to Wheeled Motorized Vehicles	24.6
CDNST located in an area open to over-snow motorized vehicles	8.0
Acres Open to Motorized Over-Snow Travel	122,844
Identified Unauthorized Roads & Trails Open	16

Continental Divide National Scenic Trail

There are approximately 29 miles of the CDNST in the planning area which are currently open to wheeled motorized travel. Per FSM direction (2300), motorized use should only be allowed on the CDNST if the route and type of use was in existence prior to November 10, 1978. Spur road 136-D1 was identified on the 1977 Helena Forest map as a trail open to motorized vehicles under 40 inches wide. As a result, any wheeled motorized vehicles exceeding 40" in width should not be authorized on NFSR 136-D1.

Other motorized segments of the CDNST are roads which existed prior to November 10, 1978. In accordance with recent direction, those routes could continue to serve as segments of the CDNST if they are primitive and motorized use does not substantially interfere with the nature and purposes of the CDNST. Most of the existing motorized segments of the CDNST are located on NFSR #136, 495, 622, 1802, 1802-B2, and 1855. Motorized use on existing CDNST segments would continue as per the current situation. Approximately 19 miles of the CDNST would be closed to wheeled motorized travel. The existing single track trail segments in the vicinity of Priest Pass and Mullan Pass would remain open to motorized trail bikes. In addition, NFSR #136–D1 would remain open to motorized use year-long.

The table under the Conclusions section lists the Continental Divide National Scenic Trail (CDNST) by mileage and proposed designation for each segment within the Divide travel planning area for each alternative. The CDNST map in the map packet coincides with the segments listed on the table at the end of this section.

Sweeny Creek Area

Existing unauthorized motorized routes located in the Sweeny Creek Area would become designated motorized trails. It's reasonable to assume that future improvements to those routes would increase motorized use. The designation of motorized routes in the Sweeny Creek Area would anger some nearby residents who are concerned about the associated impacts. Conflicts between motorized and non-motorized recreationists could continue or increase.

Kading Area

Under this alternative, NFSR 1868, the Kading Grade (MTR-502), and routes 501, MTR-503 and MTR-504 would remain open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th. This motorized activity would provide opportunities for OHV enthusiasts and hunters.

Continued use of several OHV trails in the Kading area may affect the amount and type of visitor use that occurs in Kading Campground, Kading Rental Cabin and at dispersed campsites located along the Little Blackfoot River.

Designation of motorized trails in the Kading area would most likely increase OHV use on portions of the Little Blackfoot Road #227. Rather than trailer OHVs or motor bikes to the trailheads, most motorized users would simply travel from their campsite at Kading Campground or a dispersed site adjacent to the Little Blackfoot Road. Even if those trail vehicles were licensed and street legal, that increased use of a popular Forest Road may present safety concerns that require additional management actions.

Irreversible and Irretrievable Commitments

There are no known irreversible or irretrievable commitments associated with this alternative.

Cumulative Effects

Analysis of cumulative effects on recreation considers the effects of past, present, and reasonably foreseeable future activities on the recreation resource. The spatial boundary for the actions considered in cumulative effects is the planning area. For recreation, only activities within the planning area could be expected to add to the impact of the project's activities. Temporally, actions considered date back to pre-1960 actions that are known, and date forward to all reasonably foreseeable planned future activities. A list of these actions considered is provided in Appendix B. They include timber harvesting, prescribed burning, road and trail reconstruction, recreational use, mining, and private land development.

Prior to 2001, most Helena Forest lands were open to motorized travel unless specifically closed. Through the Tri State OHV decision, management direction changed to prohibit off-route wheeled motorized travel. There was sound resource rationale for that decision but it greatly altered opportunities for motorized recreation on the Helena National Forest. Wheeled motorized travel is now authorized on existing routes only.

The Divide travel decision will be considered in respect to projects within or near the Divide Travel Area and especially to other travel decisions on the Helena National Forest. Past travel decisions made for the Big Belt Mountains, Elkhorn Mountains, Clancy-Unionville Treatment Area and Soundwood Salvage Area resulted in new motorized use restrictions. Those decisions and future travel decisions for the Lincoln Ranger District would determine not only the motorized trail opportunities provided but also public road access to the Forest.

Other past decisions that have/will contribute to cumulative effects on recreation in this analysis area include: Prickly Pear Sportsmen's Target Range, MacDonald Pass Nordic ski trails, Recreation Residence Tracts (Forest Heights and Moose Creek Villa), routine use and maintenance of Forest trails, developed recreation sites, MacDonald Pass Vista Point, Tri Arabian Horse Trail Ride, Jericho Mountain CDNST re-route, CDNST reconstruction Phase I, Monarch Creek trail reconstruction, Treasure Mountain Snowmobile trail relocation, Austin snowmobile parking lot, Helena Lions Sunshine Camp, Minnehaha trail project, and the EA for the Continental Divide National Scenic Trail. Reasonable Foreseeable projects would include the Ten Mile Road Improvement Project and the Forest-wide Hazard Tree Removal Project (see Appendix B). Impacts from the above identified projects are site-specific and would not affect travel restrictions.

Alternative 2

Direct and Indirect Effects

This alternative would designate about 10 miles of roads open to wheeled motorized vehicles solely during the big game rifle season. As a result, that motorized access opportunity would be available in the Divide Travel Area as well as portions of the North Big Belt Mountains.

Prohibiting wheeled motorized travel on 6 miles of existing unauthorized routes could displace some Forest visitors to other locations on the Helena Forest or to other areas off the Forest. However, 10 miles of existing unauthorized routes currently used by motorized vehicles would be added to the Forest transportation inventory.

The use of motorized vehicles in some locations may have already displaced some Forest visitors who seek quiet recreation opportunities. Additional displacement would only be slightly different than Alternative 1 because most of the associated motorized use already exists.

This alternative would provide motorized access to the Larabee Gulch Trailhead but only after a bridge is constructed across the Little Blackfoot River. Until such time as a bridge is constructed, Road #227-D1 would be closed to motorized use.

Alternatives 2 and 4 would designate NFSR #4104-A1 as a trail open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th. As such it would provide an important link between the Little Blackfoot drainage and the Telegraph Creek area. Until such time as a bridge, bottomless arch or culvert is constructed, Road #4104-A1 would remain closed to wheeled motorized use.

Alternatives 2 and 4 would also designate two NFSRs (#4001 and #227-D1) open to wheeled motorized travel. Access to the Golden Anchor Mine area on NFSR #4001 and Larabee Gulch trailhead NFSR #227-D1 would provide enhanced recreation opportunities. These routes would remain closed to wheeled motorized travel until a suitable crossing is constructed.

Motorized Use

Approximately 273 miles of designated roads would be open to highway legal vehicles year-long. This is approximately 2 miles less than what currently exists under Alternative 1.

Under this alternative approximately 114 miles of Forest roads would be closed to wheeled motorized vehicles year-long but open to over-snow motorized vehicles from December 2nd through May 15th. Currently, over-snow vehicle use is allowed adjacent to many of those roads but not on the roads. In addition, Alternative 1 would allow over-snow motorized vehicles from December 2nd through October 14th. Implementation of Alternative 2 could reduce both social and resource concerns associated with the use of over-snow motorized vehicles from mid-May through mid-October. If over-snow machines operate with a marginal amount of snow during the spring or fall, vegetation can be damaged and soils disturbed. In addition, the use of over-snow vehicles during the big game hunting season can cause user conflict.

About 15 miles of Forest roads would be closed to all motorized travel, including over-snow vehicles, year-long.

Approximately 10 miles of existing unauthorized routes currently used by motorized vehicles would be added to the Forest transportation inventory.

Under Alternative 2 there would be approximately 25 miles of trail open seasonally to motorized vehicles 50" in width or less. Under Alternative 2 there would be 1 mile of trail open to motorized travel year-long. Implementation of this alternative would provide seasonal motorized trail opportunities in two primary locations: Kading area and Sweeny Creek. This alternative would provide the greatest number of trail miles open to motorized vehicles.

The designation of NFSR #4104-A1 as a trail open to wheeled motorized vehicles 50" wide or less from May 16th through October 14th would provide additional motorized opportunities and access. Motorized enthusiasts would be able to travel from Ontario Creek to the Telegraph Creek area. If the vehicles were licensed and street legal, there would be expanded opportunities to travel on Forest roads in those areas.

This alternative would designate a total of approximately 10 miles of road open to wheeled motorized vehicles but from October 15th through December 1st. Those four routes, opened during the big game rifle season, would provide additional motorized access. NFSRs that would be included in this restriction code include: #335-A1 and #335-A2 (Priest Pass area), #314-J3 (Spotted Dog Creek area) and #1856 (Hahn Creek area). This feature of Alternative 2 responds to requests the Forest receives each fall for motorized access for hunting during the big game season.

This alternative would clearly designate motorized routes and simplify existing travel restrictions to foster a greater understanding of motorized regulations in the Divide Travel Area.

Table 3.3 Miles of Motorized Travel Routes Under Alternative 2

Route Type	Miles
Roads Open to Hwy Legal Vehicles (No Restrictions)	284
Roads Closed to All Motorized Vehicles (Year-long)	16
Roads Closed to Wheeled Motorized Vehicles (Year-long) Open to Over-Snow Vehicles (12/2-5/15)	112
Trails Open to Vehicles 50" or Less (No Restrictions)	1
Trails Open to Vehicles 50" or Less (5/16-10/14)	25
CDNST Non-Motorized (Closed to Wheeled Motorized Vehicles)	19.3
CDNST Open to Wheeled Motorized Vehicles	22.5
CDNST located in an area open to over-snow motorized vehicles	12.0
Acres Open to Motorized Over-Snow Travel	108,230
Identified Unauthorized Roads & Trails Open	10

Continental Divide National Scenic Trail

Under this alternative the majority of NFSR #136-D1 (2 miles) would be closed to wheeled motorized vehicles year-long. The remaining 0.5 miles, which provide access to existing stock facilities and trailhead parking, would remain open to highway legal vehicles year-long.

Existing single track trail segments would be closed to wheeled motorized travel year-long. This would prohibit the occasional wheeled motorized use that occurs on those trails and enhance non-motorized recreation opportunities.

The table under the Conclusions section lists the Continental Divide National Scenic Trail (CDNST) by mileage and proposed designation for each segment within the Divide travel planning area for each alternative. The CDNST map in the map packet coincides with the segments listed on the table at the end of this section.

Sweeny Creek Area

The existing unauthorized motorized routes located in the Sweeny Creek Area would be designated as trails open to motorized vehicles 50 inches in width or less from May 16th through October 14th. Designation of those routes would result in a need for routine maintenance, possibly reconstruction, and construction of a parking area to serve as a trailhead. Because those routes would be signed and maintained as system trails, additional funding would be needed for operation and maintenance. It's reasonable to assume that future improvements to those routes would increase motorized use in the area. Designation of these routes as system trails would provide another area on the Helena Forest specifically recognized for OHV use.

One notable change in the Sweeny Creek Area under Alternatives 2, 3, and 4 is the winter closure to motorized travel. Approximately 5,700 acres in that area (including the motorized trails) would be closed to over-snow motorized travel from October 16th through May 14th. Although that area does not receive a great deal of over-snow vehicle use at the current time, it has become popular with OHV riders both during the winter and spring.

Kading Area

Similar to Alternative 1, NFSR 1868, the Kading Grade (MTR-502), and routes 501, MTR-503 and MTR-504 would remain open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th. This motorized activity would provide opportunities for many OHV enthusiasts that camp in the Little Blackfoot drainage. It would also be supported by hunters who seek motorized access to that area during the upland bird and big game bow season.

Increased use of several OHV trails in the Kading area may affect the amount and type of visitor use that occurs in Kading Campground and Rental Cabin. The campground and cabin may become more popular with motorized trail enthusiasts. Increased motorized trail use in the area may detract from the existing setting in Kading campground and within the Little Blackfoot drainage.

Designation of motorized trails in the Kading area and on NFSR #4104-A1 would most likely increase OHV use on portions of the Little Blackfoot Road #227. Rather than trailer OHVs or motorcycles to the trailheads, most motorized users would probably travel from their campsite at Kading Campground or a dispersed site adjacent to the Little Blackfoot Road.

Irreversible and Irretrievable Commitments

There are no known irreversible or irretrievable commitments associated with this alternative.

Cumulative Effects

Past timber harvesting and road construction contributed to the existing condition of the recreation landscape, creating an area where human activity is evident, and the recreation setting is primarily that of a working landscape. In addition, past road construction for those

past harvest activities have made positive contributions to the accessibility of recreation activities in the area, such as access to hunting grounds, dispersed campsites, and snowmobile routes. Trails improved over the past several years include sections of the CDNST and the Monarch Creek Trail and Trailhead. These past activities have contributed positively to the existing condition of recreation facilities in the planning area.

Present and reasonably forseeable future activities include continued maintenance on open forest roads, including improving road and surface drainage, clearing roadside vegetation, and repairing and maintaining culverts. Ongoing roadside hazardous tree removal projects are also ongoing, and will improve the access to and safety of the recreation setting. When combined with the long-term positive impact of the action alternatives on a healthy forest recreation setting, present and future activities would have a positive effect on recreation by improving the access and setting.

Alternative 3

Direct and Indirect Effects

This alternative would reduce existing opportunities for motorized recreation. It would also simplify travel restrictions and foster a greater understanding of motorized regulations in the Divide Travel Area.

This alternative would not designate roads open to wheeled motorized travel solely during the big game rifle season (10/15 through 12/1) As a result, that opportunity would only be available in the Big Belt Mountains.

Prohibiting wheeled motorized travel on 7 miles of existing unauthorized routes could displace some Forest visitors to other locations on the Helena Forest or to other areas off the Forest. Approximately 9 miles of existing unauthorized routes currently used by motorized vehicles would be added to the Forest transportation inventory.

Prohibiting motorized use on NFSR #227-E1 would improve resource conditions because the existing road is rutted and contains several mud holes.

Approximately 251 miles of designated roads would be open to highway legal vehicles year-long. This is approximately 24 miles less than what currently exists under Alternative 1.

Under this alternative approximately 156 miles of roads would be closed to wheeled motorized vehicles year-long but open to over-snow motorized vehicles from December 2nd through May 15th. This is an increase of about 42 miles over Alternative 2. In contrast, Alternative 1 would allow over-snow motorized vehicles from December 2nd through October 14th. Implementation of Alternative 3 could reduce both social and resource concerns that are associated with the use of over-snow motorized vehicles from mid-May through mid-October.

Under Alternative 3 there would be no trails open to motorized vehicles 50” in width or less. Implementation of this alternative would provide no wheeled motorized trail opportunities in the Divide Travel Area.

This alternative would not designate motorized opportunities on closed Forest roads during the big game hunting season.

Table 3.4 Miles of motorized travel routes under Alternative 3

Route Type	Miles
Roads Open to Hwy Legal Vehicles (No Restrictions)	262
Roads Closed to All Motorized Vehicles (Year-long)	21
Roads Closed to Wheeled Motorized Vehicles (Year-long) Open to Over-Snow Vehicles (12/2 – 5/15)	156
Trails Open to Vehicles 50" or Less (No Restrictions)	0
Trails Open to Vehicles 50" or Less (5/16 – 10/14)	0
CDNST Non-Motorized (Closed to Wheeled Motorized Vehicles)	19.3
CDNST Open to Wheeled Motorized Vehicles	20.6
CDNST located in an area open to over-snow motorized vehicles	10.1
Acres Open to Motorized Over-Snow Travel	105,230
Identified Unauthorized Roads & Trails Open	9

Continental Divide National Scenic Trail

Under this alternative the majority of NFSR #136-D1 (2 miles) would be closed to wheeled motorized vehicles yearlong. The remaining 0.5 miles, which provide access to existing stock facilities, would remain open to highway legal vehicles yearlong. Approximately 0.6 additional miles of CDNST would be closed to wheeled motorized travel over Alternative 1.

Existing single track trail segments would be closed to wheeled motorized travel year-long. This would prohibit the occasional wheeled motorized use that occurs on those trails and enhance non-motorized recreation opportunities.

The table under the Conclusions section lists the Continental Divide National Scenic Trail (CDNST) by mileage and proposed designation for each segment within the Divide travel planning area for each alternative. The CDNST map in the map packet coincides with the segments listed on the table at the end of this section.

Sweeny Creek Area

The existing unauthorized routes located in the Sweeny Creek Area would be closed to motorized travel year-long. This would eliminate the existing motorized use and resulting resource damage, user conflicts, and impacts to adjacent residents. Prohibiting motorized vehicles in the Sweeny Creek Area could facilitate increased non-motorized recreation opportunities such as: hiking, horseback riding, picnicking, and nature study.

Similar to Alternative 2, approximately 5,700 acres in that area would be closed to over-snow motorized travel. Although that area does not receive a great deal of over-snow vehicle travel at the current time, this restriction would ensure quiet winter recreation opportunities for nearby residents.

Kading Area

Under this alternative, NFSRs 1868 and 501 would be closed to wheeled motorized travel year-long but open to over-snow vehicles from December 2nd through May 15th. That is also true for non-system trails MTR-502, MTR-503 and MTR-504. Current OHV travel for wheeled motorized vehicles 50" or less would be prohibited. Existing over-snow motorized travel on those routes would continue.

NFSR #227-D1 would be closed to motorized use.

Irreversible and Irretrievable Commitments

There are no known irreversible or irretrievable commitments associated with this alternative.

Cumulative Effects

Please see the discussion under Alternative 1.

Alternative 4

Direct and Indirect Effects

This alternative would reduce existing opportunities for motorized recreation. It would also simplify travel restrictions and foster a greater understanding of motorized regulations in the Divide Travel Area

Under this alternative there would be no designated roads open to wheeled motorized travel solely during the big game hunting season (10/15 through 12/1).

Prohibiting wheeled motorized travel on 6 miles of existing unauthorized routes could displace some Forest visitors to other locations on the Helena Forest or to other areas off the Forest. However, 10 miles of existing unauthorized routes currently used by wheeled motorized vehicles would be added to the Forest transportation inventory.

Alternatives 2 and 4 would designate NFSR #4104-A1 as a trail open to wheeled motorized vehicles 50" in width or less from May 16th through October 14th. As such it would provide an important link between the Little Blackfoot/Ontario Creek drainages and the Telegraph Creek area. Until such time as a bridge, bottomless arch or culvert is constructed, Road #4104-A1 would remain closed to wheeled motorized use.

Alternatives 2 and 4 would also designate two NFSRs (#4001 and #227-D1) open to wheeled motorized travel. Access to the Golden Anchor Mine area NFSR #4001 and Larabee Gulch trailhead NFSR #227-would provide enhanced recreation opportunities. These routes would remain closed to wheeled motorized travel until a suitable crossing is constructed.

Motorized Use

Approximately 264 miles of designated roads would be open to highway legal vehicles year-long. This is approximately 11 miles less than what currently exists under Alternative 1. Under this alternative approximately 106 miles of roads would be closed to wheeled motorized vehicles year-long but open to over-snow motorized vehicles from December 2nd through May 15th. This is a decrease of 8 miles from Alternative 2. In contrast, Alternative 1 would allow over-snow motorized vehicles from December 2nd through October 14th.

Alternative 4 would designate 4 miles of trails open to wheeled motorized vehicles (50" in width or less) from May 16th through October 14th.

In addition to Alternative 1, under Alternative 4 NFSRs #4104-A1, #227-D1 and #4001 would remain closed until improved stream crossings are constructed.

One additional cumulative impact unique to Alternative 4 is the closure of the Microwave Tower Road (#1802) to all motorized travel yearlong. This would have several implications. That road would no longer provide wheeled motorized access for recreation opportunities during the summer or fall months. In the past that road has enabled wheeled motorized access to an area popular for hunting, firewood gathering, and wildlife/scenery viewing. However, NFSR #1802 would still continue to serve as a segment of the CDNST. Because the road was in existence prior to 1978, motorized travel restrictions would not be implemented solely for benefit of the CDNST.

This alternative would designate a total of approximately 3 miles of road open to wheeled motorized vehicles but from October 15th through December 1st. These three routes, opened during the big game rifle season, would provide additional motorized access. NFSRs that would be included in this restriction code include: #335-A1 and #335-A2 (Priest Pass area). This feature of Alternative 4 responds to requests the Forest receives each fall for motorized access for hunting during the big game season.

This alternative would designate wheeled motorized opportunities on NFSR #335-A1, #335-A2 (Priest Pass Area), and NFSR #314-J3 located in the Spotted Dog Creek area for hunting during the big game rifle season.

Table 3.5 Miles of Motorized Travel Routes Under Alternative 4

Route Type	Miles
Roads Open to Hwy Legal Vehicles (No Restrictions)	265
Roads Closed to All Motorized Vehicles (Year-long)	25
Roads Closed to Wheeled Motorized Vehicles (Year-long) Open to Over-Snow Vehicles (12/2 – 5/15)	139
Trails Open to Vehicles 50" or Less (No Restrictions)	0
Trails Open to Vehicles 50" or Less (5/16 – 10/14)	4
CDNST Non-Motorized (Closed to Wheeled Motorized Vehicles)	21.9
CDNST Open to Wheeled Motorized Vehicles	18
CDNST located in an area open to over-snow motorized vehicles	12
Acres Open to Motorized Over-Snow Travel	105,230
Identified Unauthorized Roads & Trails Open	10

Continental Divide National Scenic Trail

Under this alternative, the majority of NFSR #136-D1 (2 miles) would be closed to wheeled motorized vehicles yearlong. The remaining 0.5 miles, which provide access to existing stock

facilities, would remain open to highway legal vehicles year-long. In addition Forest Road #1802 would be closed to motorized vehicles year-long.

Because NFSR #1802 existed prior to November 10, 1978, it should not be closed to wheeled motorized travel to meet agency direction for the CDNST. Under Alternative 4 approximately 9 miles of the existing CDNST which allows some type of wheeled motorized use would become non-motorized.

The table in the Conclusions section lists the Continental Divide National Scenic Trail (CDNST) by mileage and proposed designation for each segment within the Divide travel planning area for each alternative. The CDNST map in the map packet coincides with the segments listed on the table at the end of this section.

Sweeny Creek Area

Like Alternative 3, the existing unauthorized routes located in the Sweeny Creek area would be closed to motorized travel year-long. It's also possible this change could displace existing motorized use to other areas on the Forest. Similar to Alternatives 2 and 3 approximately 5,700 acres in that area would be closed to over-snow motorized travel. Although that area does not receive a great deal of over-snow vehicle use at the current time, this restriction might slightly enhance non-motorized winter recreation opportunities for nearby residents.

Kading Area

With the exception of over-snow vehicles during the winter, the unauthorized trails in the Kading area would be closed to wheeled motorized use. The prohibition of motorized travel on existing unauthorized trails could impact some hunters who currently use OHVs or motor bikes to access traditional hunting areas until October 15th.

This alternative could result in travel conflicts during the winter. If over-snow motorized travel is allowed on the Kading Grade (MTR-502) but prohibited on NFSR #227-E1 anyone traveling from the Beaverhead-Deerlodge Forest to the Helena Forest would not have access to over-snow motorized trails in the Little Blackfoot area.

Wheeled motorized travel on Forest Road #227-E1 would be prohibited.

Irreversible and Irretrievable Commitments

There are no known irreversible or irretrievable commitments associated with this alternative.

Cumulative Effects

Please see the discussion under Alternative 1.

Conclusions

The proposed travel plan alternatives, including Alternative 1 (No Action) are consistent with forest-wide recreation standards identified in the 1986 Helena NF Forest Plan. However, there is no established standard for the correct allocation of motorized recreation opportunities. Rather, the Forest analyses recreation opportunities in consideration of resource values, user preference and conflicts.

It is important to recognize that a rich mining history along with past forest management activities have created the network of roads and motorized routes throughout the Divide Travel area. As a result, much of the travel area is currently accessible by motorized vehicle. This

decision would not result in construction of new roads or trails but only determine where and when motorized travel is allowed on those existing routes.

Alternative 1

Under this alternative the existing condition would continue. Existing unauthorized routes currently being used by wheeled motorized vehicles would be designated and become part of the Forest transportation inventory. This would include two existing trail segments and one road segment of the Continental Divide National Scenic Trail.

An existing over-snow motorized travel discrepancy would continue. Although 71 miles of Forest Roads would remain closed to over-snow vehicles, National Forest lands adjacent to those roads would remain open to that use.

Alternative 2

Alternative 2 would add fewer existing unauthorized routes to the Forest transportation system than Alternative 1. These routes are currently open for that use under the Tri State Off-Highway Vehicle Decision of 2001. It's also likely that motorized use on those routes would increase as the trails are improved.

This alternative would result in a 4.5 mile decrease of CDNST currently open to wheeled motorized use.

This alternative identified three routes open to wheeled motorized vehicles during the big game rifle season. Because this alternative would end the existing restriction that prohibits over-snow motorized travel on about 71 miles of roads in areas open to over-snow motorized travel, it would be easier for the public to understand and follow winter travel regulations.

Alternative 3

Because Alternatives 3 and 4 feature no miles of wheeled motorized trail, these alternatives would have the greatest impact upon existing recreation use. Individuals who currently use the Divide Travel Area for OHVs would be displaced to other areas. There would be additional recreation opportunities for non-motorized activities.

This alternative would result in a 6.1 mile decrease of CDNST currently open to wheeled motorized use.

This alternative has fewer acres open to motorized over-snow travel than Alternatives 1 and 2, and could enhance the non-motorized recreation experience during the winter.

Alternative 4

Because Alternatives 3 and 4 feature no miles of wheeled motorized trail, they would have the greatest impact upon existing recreation use. Individuals who currently use the Divide Travel Area for OHVs use would be displaced to other areas. Persons who favor non-motorized recreation activities would have additional opportunities.

This alternative would provide the greatest number of road miles (25) closed to wheeled motorized travel year-long. As a result, it would have a greater impact on existing recreation opportunities associated with wheeled motorized travel than any other alternative.

This alternative would result in an 8.8 mile decrease of CDNST currently open to wheeled motorized use.

Unique to this alternative is the closure of wheeled motorized travel on the Microwave Road #1802. This route would only be open to wheeled motorized travel for administrative use and permit holders authorized to access the electronic site on MacDonald Pass. Individuals who currently utilize this road to collect firewood, pick berries, hunt and view wildlife would be displaced.

The table below compares the segments of Continental Divide National Scenic Trail (CDNST) by mileage within the Divide travel planning area with Alternative 1 being the No Action alternative in comparison to the action alternatives with the proposed designations for each segment. The DEIS map packet has a map of the CDNST that identifies the location of each segment listed in the table below.

Table 3.6 Alternative Comparisons of CDNST Segment Designations

Route #	CDNST Segment by Mile Marker	Designation	Alt 1	Alt 2	Alt 3	Alt 4
337	0 to 3.623	Non-Motorized Trail (NM Trail)	3.623	3.623	3.623	3.623
136-D1	0 to 0.5	Off-highway Legal (OHL)	0.5	0.5	0.5	0.5
136-D1	0.5 to 2.508	OHL	2.008	0	0	0
136-D1	0.5 to 2.508	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	2.008	2.008	2.008
136	11.058 to 17.305	OHL	6.247	6.247	6.247	6.247
136	17.305 to 18.943	County Road	1.638	1.638	1.638	1.638
622	1.997 to 4.725	OHL	2.728	2.728	2.728	2.728
622	4.725 to 6.783	County Road	2.05	2.05	2.05	2.05
1855-C1	0 to 1.155	OHL	1.155	1.155	1.155	1.155
1855-B2	0 to 1.283	OHL	1.283	0	0	0
1855-B2	0 to 1.283	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles	0	1.283	1.283	1.283

Route #	CDNST Segment by Mile Marker	Designation	Alt 1	Alt 2	Alt 3	Alt 4
		12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)				
1855-B1	0.367 to 0.912	OHL	0.545	0	0	0
1855-B1	0.367 to 0.912	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	0.545	0.545	0.545
1854-A1	0 to 0.218	OHL	0.218	0.218	0.218	0.218
1854	0.593 to 0.657	OHL	0.064	0.064	0.064	0.064
337	22.064 to 23.107	NM Trail	1.043	1.043	1.043	1.043
1805-D3	0 to 0.145	OHL	0.145	0	0	0
1805-D3	0 to 0.145	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)		0.145	0.145	0.145
337	23.255 to 23.358	NM Trail	0.103	0.103	0.103	0.103
355-B2	0 to 1.8	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.8	1.8	1.8	1.8
335-B1	0 to 0.071	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1)	0.071	0.071	0.071	0.071

Route #	CDNST Segment by Mile Marker	Designation	Alt 1	Alt 2	Alt 3	Alt 4
		Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)				
1802-B2	0 to 2.041	OHL	2.041	0	0	0
1802-B2	0 to 2.041	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	2.041	2.041	2.041
1802-B1	0 to 0.046	OHL	0.046	0	0	0
1802-B1	0 to 0.046	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0	0.046	0.046	0.046
1802	0 to 2.694	Roads open to highway legal vehicles 5/16-12/1 Open to over snow motorized vehicles 12/2 - 5/15 (03-RES)	2.694	2.694	0	2.694
1802	0 to 2.694	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	0	0	2.694	0
US 12	27.519 to 28.263	Highway	0.744	0.744	0.744	0.744
4197	0 to 0.613	Roads open to wheeled motorized vehicles 5/16-4/14 Open to over snow motorized vehicles, no seasonal restrictions (15-Res)	0.613	0	0	0
4197	0 to 0.613	Roads open to highway legal vehicles 5/16-12/1 Open to over snow motorized vehicles 12/2 – 5/15 (03-RES)	0	0.613	0.613	0.613
337	31.316 to 34.500	NM Trail	3.184	3.184	3.184	3.184

Route #	CDNST Segment by Mile Marker	Designation	Alt 1	Alt 2	Alt 3	Alt 4
1864	3.399 to 3.959	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (01-Res)	0.56	0.56	0.56	0.56
337	35.064 to 37.028	NM Trail	1.964	1.964	1.964	1.964
1856	4.108 to 5.979	Roads closed to wheeled motorized vehicles yearlong (06-RES) Open to over-snow motorized vehicles 12/2-10/14 (06-RES) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-RES) (Alt 2,3,4)	1.87	0	1.87	1.87
1856	4.108 to 5.979	Roads open to highway legal vehicles 10/15-12/1 (07-Res) Open to over snow motorized vehicles 12/2-5/15 (07-Res)	0	1.87	0	0
1836	0 to 1.274	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	1.274	1.274	1.274	1.274
337	40.188 to 41.019	NM Trail	0.831	0.831	0.831	0.831
495-B1	0 to 0.52	Roads closed to wheeled motorized vehicles yearlong Open to over snow motorized vehicles 12/2-10/14 (06-Res) (Alt 1) Open to over-snow motorized vehicles 12/2-5/15 (06-Res) (Alt 2,3,4)	0.52	0.52	0.52	0.52
495	4.191 to 10.688	OHL	6.49	6.49	6.49	6.49
337	48.038 to 56.94	NM Trail	8.902	8.902	8.902	8.902

Forest Plan Consistency

All alternatives would be consistent with Forest Plan goals, objectives and standards. Please refer to recreation standards contained in the Forest Plan Consistency Table (Appendix A).

UNROADED and ROADLESS

Regulatory Framework

Direction for the evaluation of unroaded lands for potential wilderness can be found in Forest Service Handbook (FSH) 1909.12(72). This handbook direction specifically defines wilderness characteristics for potential wilderness and how they should be evaluated.

There are no Forest Service regulations or laws that prohibit development of unroaded areas. In addition, there are no Forest-wide or Management Area standards specific to unroaded areas. Although the unroaded area is not designated as wilderness or located within Inventoried Roadless Areas, the effects of the Divide travel plan will be assessed using the wilderness attributes identified in Forest Service Handbook 1909.12 and the 1964 Wilderness Act. Because the Left Hand Fork Cottonwood Gulch unroaded area is contiguous with the Nevada Mountain Inventoried Roadless Area, the effects of the proposed actions on the inventoried roadless area itself will also be analyzed.

Forest Plan Direction

Portions or all of the four IRA's (Nevada Mountain, Jericho Mountain, Lazyman, and Electric Peak) are within the planning area. These unroaded areas were identified as inventoried roadless areas. For more details on each of these IRA's, please see Appendix C of the Helena National Forest Plan Final EIS. There is also management direction in the Forest Plan that applies to these IRA's. In addition to the four identified IRA's, there are contiguous unroaded lands within the planning area that also might potentially be affected by this proposal.

Approximately 50% of the planning area is within the "Roaded Natural" Recreation Opportunity Spectrum category, meaning that timber harvest or other surface use practices are evident and motorized vehicles are permitted on all parts of the road system.

Management areas H1, H2, L1, L2, M1, P3, T1, T3, T4, T5, W1, and W2 comprise the four IRAs and the one contiguous unroaded area.

Roadless Area Review and Evaluation (RARE II)

The RARE II inventory was completed in anticipation of development of the Forest Plan which was completed in 1986. Appendix C of the Forest Plan analyzed all of the inventoried roadless areas and rated them for wilderness suitability. Some of the lands were ultimately selected in the Forest Plan decision for Forest Plan recommended wilderness (P-3 management areas totaling 32,900 acres). These were in addition to the designated wilderness areas (Scapegoat and Gates of the Mountains totaling 111,600 acres). Some inventoried lands were not recommended for wilderness but instead have Forest Plan direction to maintain their unroaded character for semi-primitive non-motorized recreation and for wildlife values (Management Area R-1 totaling 34,300 acres and Management Area E-2 totaling 22,200 acres). There is an R-1 area within the project boundary – Mount Helena. This R-1 area is an area that has been designated as undeveloped land suited for dispersed recreation. It provides opportunities for semi-primitive non-motorized recreation and is characterized predominantly by natural or natural appearing environments where there is a high probability of isolation from man's activity.

2001 Roadless Rule

The 2001 Roadless Rule provides management direction for timber cutting, sale, or removal and road construction/reconstruction (36 CFR 294 Subpart B [66 FR 3244] January 12, 2001). The

Rule has been subject to continuous litigation. At the writing of this report the Rule is in effect. The Rule does not apply to motorized or non-motorized trails (66 FR 3251).

Assumptions

The Divide Travel Plan would not authorize construction of new routes or decommissioning of existing routes. This analysis is focused on determining whether existing roads and trails would be open to motorized vehicles, the type of vehicle, and season of use.

There is an increased emphasis and public demand for both undeveloped areas and motorized routes on National Forest lands.

Generally, the sight and sound of motorized vehicles would diminish the recreation experience for most visitors who seek solitude and/or undeveloped recreation opportunities.

Although the presence of motorized routes does not preclude the possibility of designating National Forest System lands for wilderness, the amount and type of that use could influence that decision.

Information Used

Helena National Forest GIS data, aerial photos and local resource-specific knowledge of the Divide travel planning area were used in this analysis.

Methodology & Scientific Accuracy

The collection of recreation use data, including the National Visitor Use Monitoring survey done in 2003, personal contacts with Forest visitors and local recreation club were used to develop this report.

Forest Service Handbook 1909.12 (72) identifies potential characteristics that can be used to identify an unroaded areas capability to be considered for future wilderness. The Divide travel plan uses these five characteristics as a way of measuring the effects of the project on the IRA's and contiguous unroaded lands within the planning area.

Natural – the general condition of the ecological function of the natural environment

Undeveloped – the degree to which the area is without permanent improvements or human habitation

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

Special Features – the capability of the area to provide other unique values

Manageability – the ability to manage the area as potential future wilderness

This analysis focuses on the potential effects of project activities on wilderness characteristics as defined in FSH 1909.12. It is recognized that expanses of IRA's and other unroaded lands provide other resource values as well. Potential project effects to other values are evaluated elsewhere as they relate to specific resources. This analysis concentrates on wilderness characteristics and compares any changes to 3the existing conditions of the identified Inventoried Roadless Areas, as well as any other contiguous unroaded lands, with potential wilderness characteristics within the planning area boundary.

Unroaded and Roadless, Affected Environment

The affected environment is within the planning area boundary for the Divide travel plan – extending from the Nevada area in the northwest, south to the Little Blackfoot and Bison Mountain area, and east to the Tenmile drainage. This area is managed by the Helena Ranger District of the Helena National Forest.

Introduction

This report discusses four discrete IRA's and one discrete unroaded area which is contiguous with the Nevada Mountain IRA.

There are four Inventoried Roadless Areas (IRA's) and one smaller area of unroaded lands (which do not have special designation) contiguous to the Nevada Mountain in the Divide travel planning area. The four IRA's are: Nevada Mountain, Jericho Mountain, Lazyman Gulch, and Electric Peak. These four IRA's were analyzed using the same characteristics of the roadless area inventory (RAREII).

The one small unroaded area located outside of but contiguous to one of the IRA's was analyzed using the same characteristics as were used in the roadless area inventory (RAREII).

The Helena Forest Plan established Forest-wide multiple use goals, objectives, and management requirements as well as management area prescriptions. The analysis of roadless lands, documented in Appendix C of the FEIS for the Plan, described each roadless area, the resources and values considered, the range of alternative land uses studied, and the effects of management under each alternative. As a result of the analysis some roadless areas were recommended for inclusion in the National Wilderness Preservation System and others were assigned various non-wilderness prescriptions. The four IRA's were assigned to Management Areas. The unroaded land contiguous to the roadless areas was assigned to management areas T-1. The proposed activities tied to the action alternatives would occur within the "T" lands (available and suitable for timber management) management areas.

The purpose of this analysis is to evaluate the environmental consequences of the proposed action and alternatives on the wilderness characteristics of the IRA's and roadless area expanse.

Semi-primitive motorized recreation is recognized as an acceptable roadless characteristic under the Forest Plan. Motorized trails were not prohibited in IRAs under the 2001 Roadless Rule (66 FR 3251).

Analysis Area

The analysis area is within the planning area boundary for the Divide travel plan – extending from the Nevada area in the northwest, south to the Little Blackfoot and Bison Mountain area, and east to the Tenmile drainage. This area is managed by the Helena Ranger District of the Helena National Forest.

The analysis area for the unroaded areas of the Divide planning area includes those portions of the IRA's within the planning area boundary as well as the contiguous unroaded areas outside of the IRA's that may have contributing characteristics to future wilderness designation in the area.

Recreation Opportunity Spectrum

Forest Service recreation management is guided by the Recreation Opportunity Spectrum (ROS), which allocates and manages outdoor recreation opportunities and activities by natural

resource setting. The distribution of summer ROS classes in the Divide travel planning area is shown in the following table. The acres displayed include the four IRA's and the one unroaded area analyzed in this report.

Table 3.7 Summer ROS Distribution in the Divide Travel Planning Area

Category	Acres	Percent of Area
Semi-primitive Non-motorized	30,620	20
Semi-primitive Motorized	28,532	18
Roaded Natural	78,120	50
Roaded Modified	15,260	10
Rural	2,960	2
Total	155,483	100

The roaded natural, semi-primitive motorized, and semi-primitive non-motorized categories predominate because of past and current development, such as roads and associated mining and timber harvest within and near the analysis area. The largest tracts of semi-primitive non-motorized areas are the IRA's.

Inventoried Roadless

The Helena Forest Plan, Appendix C (1986) contains the evaluation of Inventoried Roadless Areas on the Helena National Forest. This evaluation assessed the wilderness suitability of each IRA using the characteristics identified in the Wilderness Act of 1964 to define wilderness. The planning area includes four IRA's within the planning area as indicated on the alternative maps. However, no ground disturbance or vegetation treatment is proposed within these roadless areas.

Located within the planning area are the following four Inventoried Roadless Areas: Electric Peak, Jericho Mountain, Lazyman, and Nevada Mountain. In total, these Inventoried Roadless Areas comprise approximately 1,107 acres of private land and 56,204 acres of National Forest lands within the Divide Travel Area. Currently there are motorized travel routes located within three of the Inventoried Roadless Areas as indicated in the following table and shown on alternative maps. The characteristics of each Inventoried Roadless Area are described below. Additional information pertaining to the IRAs is found in the Helena Forest Plan Environmental Impact Statement Appendices A, B, and C.

Table 3.8 Inventoried Roadless Areas (acres and miles open to motorized activities)

Inventoried Roadless Area	Appx. Acres of NF in Planning Area	Miles of Motorized Routes (w/n Planning Area) & w/n Inventoried Roadless Area	Acres Open to Over Snow Motorized Vehicles w/n IRA
Nevada Mountain	8,435	2*	8,435
Jericho Mountain	8,415	4.11	8,415
Lazyman	11,503	0.08	0

Inventoried Roadless Area	Appx. Acres of NF in Planning Area	Miles of Motorized Routes (w/n Planning Area) & w/n Inventoried Roadless Area	Acres Open to Over Snow Motorized Vehicles w/n IRA
Electric Peak	27,851	7.2	9,550

*These 2 miles are within the IRA, but located on the Lincoln Ranger District, outside of this planning area boundary.

Nevada Mountain (1606)

The Nevada Mountain Inventoried Roadless Area (IRA) straddles the Continental Divide approximately 30 miles northwest of Helena, Montana in both Lewis & Clark and Powell Counties. A portion of this IRA is located on the Lincoln Ranger District. Local roads access the IRA and a wheeled motorized trail is located on the north end (Lincoln Ranger District). Topography includes steep slopes capped with broad rounded ridges on the main divides. Elevations vary from about 5,500 feet in Jefferson Creek to 8,330 feet at the summit of Black Mountain. This IRA includes the following management areas; M1, T1, T3, and W1.

The only portion of the Nevada Mountain IRA considered within this analysis area is that which is located on the Helena Ranger District, approximately 8,435 acres or 17% of the IRA. The Lincoln Ranger District is currently analyzing the Blackfoot Non-Winter Travel plans which incorporates the remainder of the IRA. Therefore, from this point on, unless otherwise noted, when this IRA is discussed, it will only pertain to that portion of the IRA within the Helena Ranger District.

Wilderness Attributes

Natural

Evidence of past mining activity can be found along stream bottoms near the edge of the area. Although there are almost two miles of road within the IRA open to motorized vehicles, the roads are not located within the planning area. Hunting is the most popular recreation activity within the Nevada Creek area. The Continental Divide National Scenic Trail passes through the area and provides opportunities primarily for hiking and horseback riding. An old jeep road (#136-D1) extends from Ophir Road #136 to a scenic bench near Black Mountain. A segment of this route is currently open to wheeled motorized vehicles yearlong but only to the middle of Section 5 in T11N, R7W. It is occasionally used by OHV's, four wheel drive vehicles, trail bikes and snowmobiles. Currently all National Forest lands in the IRA are open for snowmobiling.

Undeveloped

The Nevada Mountain Inventoried Roadless Area is about 30 miles northwest of Helena in both Lewis and Clark and Powell counties. The undeveloped attribute describes the degree to which developments and uses are apparent to most visitors. Factors that contribute to the level of development include:

- Prescence of roads and trails
- Presence of developments (Campgrounds, dams, structures, facilities)
- Use of motorized equipment, mechanical transport, landing of aircraft

IRA lands on the Helena Ranger District are currently open for cross-country snowmobile travel.

With the exception of a few existing roads and trails, the area is undeveloped. The Cellar Ogilvie Trail #312, which is located in the northeast corner of the IRA and outside of this planning area, is managed seasonally for OHVs.

Outstanding opportunities for solitude or primitive unconfined recreation

Solitude is a personal, subjective value defined as the isolation from sights, sounds, and presence of others and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities. Factors that add to solitude within the IRA area are:

- Distance from roads and trails
- Topographic features, including screening from sights and sounds
- Experiences available (with and without developments)

In the southeast portion several roads exist, but are closed yearlong. An old jeep road (136D) bisects the southeast section of the IRA. Private land exists along the southern boundary. There are limited opportunities for visitors to enjoy solitude and unconfined recreation unless they are within about ½ mile of the Continental Divide.

Special Features

A section of the Continental Divide Trail runs along the eastern boundary of the planning area.

Manageability

The current IRA boundary on the Helena Ranger District does not follow any topographic features or roads. As a result, the eastern IRA boundary located within the planning area is difficult to identify on the ground.

Jericho Mountain (1607)

The Jericho Mountain Inventoried Roadless Area (IRA), WHICH straddles the Continental Divide, is approximately 10 air miles southwest of Helena, Montana in both Lewis and Clark and Powell Counties. It encompasses approximately 8,438 acres. This IRA includes the following management areas: H1, H2, L1, M1, T1, T4, T5, and W1.

The area is easily accessible from adjacent roads, especially the Tenmile and Minnehaha Creek Roads to the east. One road (#1863) extends about 1½ miles north from Bullion Park into the IRA. Topography changes from the 5,200 foot valley floor to an elevation of 7,200 feet on the divide. There are several parcels of private land (with evidence of past mining activity) located within the IRA. Due to the close proximity of Helena, the Jericho Mountain IRA is popular for hiking, hunting and some mountain biking. There have been a few reports of motorized incursions in this area. Currently, all National Forest lands within the Jericho Mountain IRA and Divide Travel Area are open for snowmobiling.

Because this IRA is bordered by private land, roads, and mining claims, there are no contiguous unroaded areas.

Wilderness Attributes

Natural

The impacts of human activity are present in much of the area. Past mining has created access roads throughout the area. There are many roads that provide access to private land. Mining claims and cabins are scattered throughout the area.

Undeveloped

The Jericho Mountain Inventoried Roadless Area is about 10 miles southwest of Helena in both Lewis and Clark and Powell counties. The land is open for cross-country snowmobile travel. The area has been heavily impacted by past mining activity.

Outstanding opportunities for solitude or primitive unconfined recreation

This IRA is long and narrow. The Continental Divide splits the area – creating most of the topographic screening. People traveling along the higher open ridges on the north end can see human activities and development within the area or adjacent areas.

Special Features

A key feature within this area is the Continental Divide National Scenic Trail (CDNST) which extends from MacDonald Pass to Road #1863. This segment of the CDNST was previously closed to any type of motorized use in a special order signed in September 2004.

Manageability

The northern boundary is located south of U.S. Highway 12. The east and south sides are bordered by the Tenmile-Minnehaha Road – this road accesses the Forest and a nearbysubdivision.

The boundaries are defined by forest roads, private land, and topographic features.

Lazyman (1608)

The Lazyman Inventoried Roadless Area (IRA) is located approximately 10 air miles southwest of Helena, Montana in Lewis and Clark County. It encompasses approximately 11,503 acres. This IRA includes the following IRAs; H1, L1, L2, M1, R1, T1, T4, T5, W1, and W2.

The northern boundary runs adjacent to private land. The west side of this area is easily accessible off the Rimini Road #695 and the east side is accessible from a county road. Non-motorized access into the IRA from the south is available off a former road (#578) which extends between Travis Creek and the Chessman Road. An old roadbed (#4177), which is closed to motorized travel, also extends to the top of Colorado Mountain. That road was used to access a fire lookout tower which was removed many years ago. Elevation varies from approximately 4,800 feet on the north to about 7,223 feet on Colorado Mountain. Sounds associated with human activity are evident throughout most of the area.

Because this IRA is bordered by private land and roads, there are no contiguous unroaded areas adjacent to the IRA.

Wilderness Attributes

Natural

Highway 12 is located approximately one mile to the north and the popular Tenmile Road runs along the western boundary. The impacts of human activities are present in much of the area. Past mining and logging activities have created access roads throughout the area. There are

many roads that provide access to private land. Homes are easily visible from high points. Private lands account for more than 500 acres within the IRA. Sounds resulting from human activity can be heard throughout most of this IRA.

Undeveloped

The Lazyman Inventoried Roadless Area is located about 10 miles southwest of Helena in Lewis and Clark County. All National Forest System lands within the Lazyman IRA are currently closed to snowmobiles.

Outstanding opportunities for solitude or primitive unconfined recreation

The area is dissected with tributaries of Colorado Gulch and Tenmile Creek and is used for hiking, hunting, and camping. Hiking within the IRA is popular near the Ten Mile Picnic area and in Black Hall Meadows. Because the IRA is close to Helena and residents in the Rimini area, it is a popular area for big game hunting. Visitors from the Feathered Pipe Ranch frequent the north end of the IRA on existing non-system trails. Human activities are easily seen and heard within this area.

Special Features

Colorado Mountain is the highest point (7,217 feet) in this IRA. It sits at 7,223 feet. Major topographic features, in addition to Colorado Mountain, include Black Mountain and Black Hall Meadows.

Manageability

The northern boundary, which parallels private land, is located 1½ to 3½ miles south of U.S. Highway 12. The eastern boundary is defined by the Park City and Travis Creek Roads. The southern boundary is located just south of Black Halls Meadows and extends to the Beaver Creek Road #299.

Public access in the north is restricted by private land adjacent to the IRA. Much of the private land was acquired by historic patented mining claims. The most popular access into the IRA occurs from the west off the Tenmile Road #695.

Electric Peak IRA (1609)

The Electric Peak Inventoried Roadless Area (IRA) is located in Powell and Jefferson Counties, approximately 30 air miles southwest of Helena, Montana. Approximately 60% of the IRA (about 27,850 acres) is on the Helena National Forest, the remainder is on the Beaverhead-Deerlodge National Forest, with the remainder on the Beaverhead Deerlodge National Forest. The Little Blackfoot Road (227) and Kading Campground are excluded from the inventoried acres. This IRA includes the following management areas; L1, M1, P3, T1, T3, T4, T5, and W1.

The Record of Decision (ROD) for the Forest Plan (FP) determined that the lower 2/3 (approximate) of this IRA is suitable for wilderness designation and thereby designated it as Management Area P3 (Forest Plan proposed wilderness). Activities in accordance with FSM 2300 and Forest Plan direction are allowed in proposed wilderness.

The HNF portion of the IRA is bordered by private land and roads. Therefore, there are no contiguous unroaded areas adjacent to the IRA included in this analysis.

Wilderness Attributes

Natural

People recreating along the higher ridgelines may view human activities and development within the IRA. Signs of past mineral and logging activities are found throughout the area.

Recreation activity in the Electric Peak IRA is extensive and includes both motorized and non-motorized trail use including: OHV's, trail bikes, snowmobiles, horseback riding, mountain bikes, and hiking. However, there is an exception – the portion of the Electric Peak IRA that is proposed wilderness excludes motorized vehicle use including over-snow vehicles. Dispersed camping is popular along the Blackfoot River corridor and near Blackfoot Meadows. Most of the IRA is extremely popular for big game hunting, during the bow and rifle seasons.

An extension of the Little Blackfoot Road (#227–E1) proceeds from just south of the campground to an undeveloped trailhead located in Section 29. Two additional roads, closed to wheeled motorized travel, are also located in the IRA. There are four non-system trails (501, MTR-502, MTR-503, and MTR-504) currently open to wheeled motorized vehicles located within the area, all in the vicinity of Kading Cabin.

The IRA also contains about 530 acres of private land.

Forest Road #1870–A1, which provides access to private land, is located in the northern portion of the IRA.

Forest Road 1801-A1 is closed to all motorized vehicles year long.

Undeveloped

The Blackfoot Meadows area is popular for a variety of dispersed recreation such as: hiking, hunting camping and fishing.

Outstanding opportunities for solitude or primitive unconfined recreation

In the northern portion of the IRA, recreation activities tend to be concentrated along the Little Blackfoot River. Associated road noise can be heard near the Little Blackfoot River Road (#227) and the Ontario Creek Road (#123).

There are several non-motorized trails in the IRA located on the Helena Forest: Bison-Blackfoot #328, Blackfoot Meadows #329, Continental Divide #337, Larabee Gulch #359 and Monarch Creek #362. Segments of three designated snowmobile trails are located within the planning area and Electric Peak IRA. It should be noted snowmobiling is allowed on approximately 34% (9,550 acres) of the Electric Peak IRA within the Divide Travel Area. An area restriction which prohibits motorized vehicles within part of the Electric Peak Roadless Area was signed in December of 1997

The best opportunities for solitude and/or primitive recreation are located within the interior of the IRA, especially near Blackfoot Meadows.

Special Features

Approximately 10 miles of the Continental Divide National Scenic Trail are located within or adjacent to the Electric Peak IRA. The IRA also includes other special features such as: Bison Mountain, Thunderbolt Mountain, Electric Peak and Cliff Mountain. These mountains are over 8,000 feet in elevation.

Eleven miles of the Little Blackfoot River located within the IRA have been classified as eligible for Wild and Scenic River designation. A suitability study for these segments is the next step in the designation process.

Manageability

Many of the IRA boundaries are well-defined by topographic features (such as roads) along more than half of the perimeter.

Divide Unroaded Areas Contiguous to IRA's

The analysis evaluates the effects to areas that have not been previously roaded, otherwise referred to as "unroaded" areas that are contiguous to IRA's. One area was identified within the Divide travel planning area.

Unroaded areas were defined by identifying areas within the Divide planning area that appeared to be unroaded, where unroaded was described as areas without classified roads that weren't already inventoried as roadless and of a size and configuration that may be sufficient to protect the inherent characteristics associated with its unroaded condition. One area was identified using this approach. The area contiguous to the SE border of the Nevada Mountain IRA.

The area was analyzed to determine if it might have some of the "wilderness characteristics" normally attributed to the IRA's. The same five characteristics that were used for IRA's were used for this contiguous unroaded area.

- Natural – The extent to which long-term ecological processes are intact and operating.
- Undeveloped – The degree to which the impacts documented in natural integrity are apparent to most visitors.
- Outstanding opportunities for solitude or primitive unconfined recreation – Solitude is a personal, subjective value defined as the isolation from sights, sounds, and presence of others and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities.
- Special features and values – Unique ecological, geographical, scenic, and historical features of an area.
- Manageability – The ability to manage an area for wilderness consideration and maintain wilderness attributes.

The affected environment of the unroaded area was determined based on team member knowledge and interaction. The area is described using the attributes and characteristics identified above. As part of the planning area, other characteristics of the unroaded areas were considered in the other resources analyzed for this project, though the other resources did not address them individually as discrete entities.

The majority of the Divide travel planning area was determined to have a Recreation Opportunity Spectrum (ROS) classification of Roaded Natural which means the area has a mostly natural appearance with access by conventional motorized vehicles.

Rationale for inclusion/exclusion of areas to be considered as Contiguous Unroaded

When looking at the Divide travel planning area for contiguous unroaded areas, several features were considered. The Divide travel planning area is already heavily developed with roads, private land, mining, and developed recreation sites. All of these features play into the

wilderness characteristics that were evaluated. These features produce sights and sounds that are not conducive to wilderness experiences. These features were found to be prevalent throughout most of the planning area except in one location. This location is an area that is adjacent to the southeast part of the Nevada Mountain IRA.

Nevada Mountain IRA and Contiguous Unroaded Lands (Left Hand Fork Cottonwood Gulch)

Federal land in the planning area of the Nevada Mountain IRA is 8,435 acres. When combined with the approximate 480 acre Left Hand Fork unroaded area, the area encompasses 8,915 acres. The unroaded area runs along the southeast boundary of the Nevada Mountain IRA in T11N, R9W, Sec. 1. This land was analyzed for its capabilities as part of the Forest Plan analysis and was given a T-1 (timber production emphasis) management allocation.

In assessing the wilderness capability of the Nevada Mountain IRA, Appendix C of the 1986 Helena Forest Plan states under the heading "Natural Integrity and Appearance":

"Roads and trails on the ridges, mining, and irrigation ditches are the disturbances to the natural appearance. When away from these relatively small scale disturbances, the area appears quite natural." (p. C/115.)

The Record of Decision for the Plan designated this unroaded area as a T-1 management area (Forest Plan timber management). Again, this unroaded area is contiguous with the Nevada Mountain IRA which is not considered suitable for management as wilderness.

The Left Hand Fork Cottonwood Gulch unroaded area is small (about 480 acres), but it is contiguous to the southeastern portion of the Nevada Mountain Roadless Area (1606). The northwest part of the area can be accessed by a 2 track road (Forest Road #774-B1) which originates to the north, in Section 36. There is also access to the northeast part of the section via another two-track road that originates in Section 31. This two track runs parallel to the Right Hand Fork of Dry Creek. The southern boundary runs parallel to Forest Road #136. The western boundary is defined by the Nevada Mountain IRA. As was common during the RAREII inventory, this unroaded parcel defined a narrow buffer between the inventoried roadless area and an existing road.

Natural

This unroaded area is entirely located on National Forest system lands. There has been no previous management within this area. The coniferous vegetation component has recently been subject to high levels of mountain pine beetle mortality. Native vegetation predominates in this area. The Left Hand Fork of Cottonwood Gulch runs along the northeast part of the area.

Undeveloped

Although this area is small, it does retain a natural appearing landscape in the areas between the IRA and the existing roads: #136, #774, and #4036. When this unroaded area is combined with the IRA to the north, it provides approximately 480 additional acres of landscape in a natural appearance.

Outstanding opportunities for solitude or primitive unconfined recreation

The ROS classification for this unroaded area is semi-primitive motorized. The ROS for the Nevada Mountain IRA is also semi-primitive motorized. Semi-primitive motorized indicates there are moderate opportunities for solitude, tranquility, and closeness to nature. There is a high degree of self-reliance, challenge and risk in using motorized equipment. There is a

predominantly natural appearing environment. There is a low concentration of users but there is also often evidence of other users on trails. On site controls and restrictions are minimum and subtle. Vegetative alterations are very small in size and number, and are widely dispersed.

Special Features and Values

There are no special features or values within this unroaded area. It is primarily used for recreation during the big game hunting season. Other than being adjacent to the IRA and CDNST, there are no special features.

Manageability

Because the area is located adjacent to a portion of the IRA not considered manageable as wilderness, it does not lend itself to management as wilderness.

Unroaded and Roadless, Environmental Consequences

This analysis considers the four IRA's as well as the contiguous unroaded piece adjacent to the Nevada Mountain IRA. The Nevada Mountain IRA and the contiguous unroaded lands in the Left Hand Fork Cottonwood Gulch are combined so as to evaluate the impacts of proposed actions on the entire unroaded expanse.

This section describes the environmental consequences of implementing the No Action Alternative, and three action alternatives. Effects are disclosed by tracking the following indicators: changes to the wilderness attributes of the unroaded areas, specifically:

- Natural – The extent to which long-term ecological processes are intact and operating.
- Undeveloped – The degree to which the impacts documented in natural integrity are apparent to most visitors.
- Outstanding opportunities for solitude or primitive unconfined recreation – Solitude is a personal, subjective value defined as the isolation from sights, sounds, and presence of others and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities.
- Special features and values – Unique ecological, geological, scenic, and historical features of an area.
- Manageability – The ability to manage an area for wilderness consideration and maintain wilderness attributes.

Effects Common to All Alternatives

Irreversible Commitments

There would be no irreversible commitments with any alternative.

Cumulative Effects

Cumulative Effects in the Divide travel planning area include past, present, and reasonably foreseeable actions. The cumulative effects analysis area boundary for the unroaded analysis is the same as the planning area boundary.

The activities proposed by all of the action alternatives are not consumptive. Roads and trails are being proposed for opening/closing, along with timing restrictions. None of the actions are ground disturbing. As described below, the effects would be common to all of the action alternatives.

Livestock grazing

Past, present, and future grazing could affect wilderness character by the presence of livestock and the structures used to manage the livestock – gates, fences, and water improvements. This could affect the characteristics of remoteness and solitude. In addition, as a result of the grazing, landscapes may appear to have shorter grasses. However, overall, these impacts would have minimal effects to the wilderness characteristics of the IRA's.

Noxious Weed Treatments

Noxious weeds are typically treated along roads using mechanized equipment. Hand treatments can occur in patches that are off the roads. Livestock and biological agents may also be used. The presence of mechanized equipment and livestock could affect a user's sense of remoteness and solitude. Using hand treatments and biological agents would have a minimal effect. The sight of dead weeds, regardless of treatment type, may also affect ones sense of remoteness and solitude. However, overall, these effects would have minimal impacts to the wilderness characteristics of the IRAs.

Hazard Tree Removal

Roadside hazard tree removal would open the road corridor, visually making the road(s) more visible from within and around the IRAs. The sights and sounds of the mechanized equipment used during operations could also have a short-term impact. These could affect the sense of naturalness and solitude. Over time, as the vegetation grows back and fills in this space, the effects would lessen.

Hazard tree removal in existing developed recreation sites would also visually change the areas. As with roadside hazard tree removal, this could affect ones sense of solitude and remoteness. However, while these sites may be within sight of an IRA, the effects would be minimal and over time as the vegetation grows and fills in these areas, the effects would be even less.

Road Maintenance

There are numerous roads within and adjacent to the IRAs. Periodic road maintenance activities would not change the roads or add to them. The sight and sound of equipment when maintenance activities occur may indirectly affect ones sense of solitude or remoteness. However, these effects are short term and overall, the wilderness character would not be affected by these activities.

Trail Maintenance/Reconstruction

Routine maintenance and reconstruction of non-motorized and motorized trails could incorporate the use of mechanized equipment and hand tools. This could indirectly affect ones sense of solitude and naturalness. At the same time, these trails are often considered to be the unique features found in the IRAs – often used to access the IRAs. Overall, these effects would be short term and would have minimal impacts to the wilderness characteristics.

Private Timber Harvest

Private timber harvest on lands within sight distance of IRAs would further reduce the natural integrity and feelings of solitude and remoteness. Private harvest has occurred in the past within

the Jericho Mountain IRA. The harvest activities including the associated hauling would have had an impact to the natural integrity, and sense of solitude and remoteness. These characteristics have since improved over the past 15+years due to revegetation.

Private Roads/Special Use Permit Roads

There are several private roads/special use permit roads in the Lazyman and Jericho Mountain IRAs due to private lands and mining claims. The presence of these roads already affects the naturalness and solitude of the IRAs. When combined with the actions proposed in any of the alternatives, the effects would have a minimal impact to the overall wilderness characteristics of the IRAs.

Effects Common to All Action Alternatives

Under all action alternatives, impacts to wilderness attributes 1 through 3 (Natural, Undeveloped, and Remoteness/Solitude) would occur during the timeframes when project activities are actually taking place. The effects to Natural and Undeveloped in particular would persist in the long term as well, perhaps 50 years. This effects analysis focuses on assessing effects to the unroaded resource following completion of the activities.

Irretrievable Commitments

This travel plan analysis displays effects associated with a decision to authorize motorized travel on designated Forest roads and trails. Because the Divide Travel Plan would not authorize construction of motorized routes, there would be no irretrievable commitment of resources.

Alternative 1, No Action

The No Action Alternative would leave the current unroaded character unchanged from the descriptions presented in the Affected Environment section.

Alternative 2

Nevada Mountain IRA and contiguous unroaded lands (Left Hand Fork Cottonwood Gulch)

Access to the southeast part of the IRA via route #774 would remain the same.

Direct motorized access into the contiguous unroaded expanse does not currently exist and would not change under Alternative 2.

Natural

The natural attribute describes the extent to which long-term ecological processes are intact and operating.

While long-term ecological processes would be expected to continue operating following the changes proposed under Alternative 2, the new presence of over snow motorized vehicles accessing the area via Road 4044-E1 could reduce the apparent naturalness of this part of the IRA during the winter – visually from the tracks. Over snow motorized vehicles could temporarily change the natural characteristics of the area from the visual appearance of snowmobile tracks. However, it should not change the physical characteristics. This would provide an additional 1.7 miles of road available to over snow motorized vehicles. However, at the same time, acres available to over snow motorized vehicles would be reduced by approximately 1,005. This would occur in the southwest part of the IRA, adjacent to the private land boundary. This decrease in acres would improve the natural integrity of the IRA. Therefore, in regards to over snow

motorized vehicles, the newly available route #4044-E1 would provide access into the IRA, but at the same time the number of acres available to this type of use would be reduced.

In regards to Road #136-D1, the reduction in the numbers of motorized vehicles would enhance the naturalness of the IRA. However, the presence of over snow motorized vehicles could reduce the natural integrity of the area during the winter.

In addition, trail #136-007 would be open to motorized vehicles 50" or less in width with no seasonal restrictions. This could increase use along the southern part of the IRA, thereby reducing the naturalness of the area.

Increased use of motorized vehicles also poses an indirect risk of noxious weed establishment. While Alternative 2 would potentially prevent and/or address this problem, invasive species would compromise the natural integrity of the area. Please refer also to the Weeds Background Report for this project.

The approximate 480 additional acres landscape in a natural appearance would directly serve to enhance this quality within the adjacent Nevada Mountain IRA. However, indirectly, the additional potential for increased access into the area via over snow motorized vehicles could reduce this quality.

Undeveloped

While route #4044-E1 would provide over snow motorized vehicle access into the IRA, the number of acres available to this type of use would be reduced. The undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

As noted in the discussion of the Nevada Mountain IRA, the IRA perimeter offers a somewhat reduced opportunity for a primitive experience. The contiguous unroaded area abuts and extends the perimeter of the IRA. Access into the IRA on existing routes would not be changed. However, access into the IRA via over snow motorized vehicles would be enhanced. This use could greatly reduce the opportunities for solitude. While at the same time, the number of acres available to over snow motorized vehicles would be reduced, thereby possibly increasing the opportunities for solitude. Therefore, the overall change to the opportunities for solitude would be negligible.

Special Features and Values

A portion of the Continental Divide National Scenic Trail (CDNST) is located within the Nevada Mountain IRA. The closure of 2.5 miles of Road # 136-D1 to wheeled motorized vehicles may enhance the special values associated with this nationally designated trail.

Manageability

The contiguous unroaded area adjacent to the Nevada Mountain IRA does not have any additional readily identifiable topographic features. It does not lend itself to management as wilderness. However, it could be considered an extension of the Nevada Mountain IRA, though this would not be consistent with the Forest Plan management direction for the area.

Because this unroaded area does not meet the criteria for potential wilderness designation, Alternative 2 would not reduce the existing capability of this area's suitability for wilderness recommendation. In other words, neither this unroaded area nor the portions of the adjacent inventoried roadless area indirectly affected by the activities are considered suitable for future wilderness designation and both would remain unsuitable after project implementation.

Jericho Mountain IRA (1607)

The portion of the Jericho Mountain IRA that is being analyzed in this report is approximately 8,415 acres.

Natural

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the apparent naturalness of the IRA. In addition, the reduction of approximately 6,050 acres open to over snow motor vehicles would add to the apparent naturalness.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes (about 1.7 miles) would enhance the opportunities for solitude in the IRA. In addition, the reduction in acres open to OSMV would add to the opportunities for solitude.

Special Features and Values

The CDNST runs through the west side of this IRA. There are no changes proposed to the CDNST. The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 2 for this portion of wilderness criteria.

Manageability

Because much of this IRA is already bordered by roads, private lands, and trails, the proposed changes under Alternative 2 would not affect the manageability of the IRA.

Lazyman (1608)

Alternative 2 proposes no changes to the existing condition. Please see the description above.

Natural

There would be no change to motorized routes or the acres available to OSMV. Therefore, the effects to the apparent naturalness would not change.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

There would be no change to motorized routes or the acres available to OSMV. Therefore, the effects to the opportunities for solitude or primitive recreation would remain the same.

Special Features and Values

Access to the Black and Colorado Mountain areas would remain the same.

Manageability

The majority of this IRA in the project boundary is bordered by roads and topographic features. The proposed changes under Alternative 2 would not affect the manageability of the IRA.

Electric Peak IRA (1609)

Natural

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes (about 2.3) would enhance the apparent naturalness of the IRA. There would be no change in the number of acres available to OSMV. Therefore, the effects to the apparent naturalness would not change.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the opportunities for solitude in the IRA. Since the number of acres available to OSMV would remain the same, the impacts from those types of vehicles would not change.

Special Features and Values

Access into the Bison Mountain area and Blackfoot Meadows would remain the same. As a result there would be no change to existing special features and values.

There are no changes proposed to the CDNST.

The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 2 on this wilderness criterion.

Manageability

The majority of this IRA in the project boundary is bordered by roads and topographic features. The proposed changes under Alternative 2 would not affect the manageability of the IRA.

Alternative 3

Nevada Mountain IRA and contiguous unroaded lands (Left Hand Fork Cottonwood Gulch)

The portion of the Nevada Mountain IRA that is being analyzed in this report is approximately 8,435 acres. When combined with the approximate 480 acre Left Hand Fork Cottonwood Gulch contiguous unroaded area, the area encompasses approximately 8,915 acres. The contiguous unroaded area is approximately one mile south of the Forest boundary.

Access into the southeast part of the IRA via route #774 would remain the same.

Direct motorized access into the contiguous unroaded expanse does not currently exist and would not change under Alternative 3.

Natural

Over snow motorized vehicles would only be authorized on 682 acres within the IRA. This is a reduction of approximately 6,748 additional acres closed to OSMV over Alternatives 2 and 4. The reduction of OSMV use within the IRA could enhance the natural character of the area during the winter months.

One other difference is that trail #136-007 would be closed yearlong. With this closure, the natural integrity of the IRA would be slightly improved. Fewer motorized vehicles would use this as a way to access the IRA.

Undeveloped

Because the actions are the same as Alternative 2, the effects would also be the same as Alternative 2.

Outstanding opportunities for solitude or primitive unconfined recreation

Over snow motorized vehicles would be prohibited on all but 682 acres within the IRA. This would provide about 6,748 additional acres closed to OSMV over Alternatives 2 and 4. The reduction of OSMV use within the IRA could enhance the opportunities for solitude and primitive recreation during the winter months.

Because trail #136-007 would be closed yearlong to motorized use, the opportunities for solitude would be slightly improved.

Special Features and Values

The Continental Divide National Scenic Trail (CDNST) is located within the Nevada Mountain IRA. The closure of 2.5 miles of Road # 136-D1 to wheeled motorized vehicles may enhance the special values associated with this nationally designated trail.

Manageability

There would be no change and the effects would be the same as Alternative 2.

Jericho Mountain IRA (1607)

Natural

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the apparent naturalness of the IRA. In addition, the reduction of approximately 6,050 acres open to over snow motorized vehicles would add to the apparent naturalness.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes (about 1.7 miles) would enhance the opportunities for solitude in the IRA. In addition, the reduction of approximately 6,050 acres open to over snow motorized vehicles would add to the opportunities for solitude.

Special Features and Values

The CDNST runs through the west side of this IRA. There are no changes proposed to the CDNST. The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 3 on this portion of wilderness criteria.

Manageability

Because much of this IRA is already bordered by roads, private lands, and trails, the proposed changes under Alternative 3 would not affect the manageability of the IRA.

Lazyman (1608)

Alternative 3 proposes no changes to the existing condition. Please see the description above.

Natural

Alternative 3 proposes no changes to the existing condition and therefore the effects to the apparent naturalness would not change.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

There would be no change to motorized routes or acres available to OSMV. Therefore, the effects to the opportunities for solitude or primitive recreation would remain the same.

Special Features and Values

A portion of the CDNST runs through the west side of this IRA. There are no changes proposed to the CDNST. The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 3 for this portion of the wilderness criteria.

Manageability

Because much of this IRA is already bordered by roads, private lands and trails the proposed changes under Alternative 3 would not affect the manageability of the IRA.

Electric Peak IRA (1609)

Natural

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the apparent naturalness of the IRA. There would be no change in the number of acres available to OSMV. Therefore, the effects to the apparent naturalness of the IRA during the winter would not change.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the opportunities for solitude in the IRA. Since the number of acres available to over snow motorized vehicles would remain the same, the impacts from that use during the winter would not change the existing opportunities for solitude or primitive recreation.

Special Features and Values

Access into the Electric Peak IRA for OSMV would not change.

There are no changes proposed to the CDNST.

The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 3 on this portion of wilderness criteria.

Manageability

The majority of this IRA in the project boundary is bordered by roads and topographic features. The proposed changes under Alternative 3 would not affect the manageability of the IRA.

Alternative 4

Nevada Mountain IRA and contiguous unroaded lands (Left Hand Fork Cottonwood Gulch)

The portion of the Nevada Mountain IRA that is being analyzed in this report is approximately 8,435 acres. When combined with the approximate 480 acre Left Hand Fork Cottonwood Gulch contiguous unroaded area, the area encompasses approximately 8,915 acres. The contiguous unroaded area is approximately one mile south of the Forest boundary.

Access into the southeast part of the IRA via route #774 would remain the same.

Access into the contiguous unroaded does not currently exist and would not change under Alternative 4.

Natural

The direct effects of Alternative 4 would be very similar to Alternative 2, with the exception of the change of 136-007 from an unauthorized trail to a trail (with seasonal restrictions) open to motorized vehicles 50" or less. During the open season, this trail would see increased use, as compared to the past. Because of the decrease in availability of authorized trails in other areas on the Forest, use on the trail could increase. This increase would affect the natural integrity of the IRA and the contiguous unroaded area.

Increased use of motorized vehicles also poses an indirect risk of noxious weed establishment. While Alternative 4 would potentially prevent and/or address this problem, invasive species would compromise the natural integrity of the area. Please refer also to the Weeds Background Report for this project.

Undeveloped

Physical changes to the landscape would include the development of the unauthorized trail to an authorized trail. This would include disturbing the trail/road bed, making it usable for motorized vehicles 50" or less. Therefore, the undeveloped character would be slightly reduced.

Outstanding opportunities for solitude or primitive unconfined recreation

As noted in the discussion of the Nevada Mountain IRA, the IRA perimeter offers a somewhat reduced opportunity for a primitive experience. The contiguous unroaded area abuts and extends the perimeter of the IRA. Access into the IRA on existing routes and via over snow motorized vehicles would be similar to Alternative 2.

In addition, converting the unauthorized trail to one available to motorized vehicles 50" or less (seasonally) could reduce the opportunity for solitude. Although the trail isn't located within the IRA, it is adjacent to the southern border and those individuals looking for solitude in that portion of the IRA could be affected by the additional presence and noise of motorized vehicles.

Special Features and Values

The Continental Divide National Scenic Trail (CDNST) is located within the Nevada Mountain IRA. The closure of 2.5 miles of Road # 136-D1 to wheeled motorized vehicles may enhance the special values associated with this nationally designated trail.

Manageability

The contiguous unroaded area adjacent to the Nevada Mountain IRA does not have any additional readily identifiable topographic features. It does not lend itself to management as wilderness. It could be considered an extension of the Nevada Mountain IRA, though this would not be consistent with the Forest Plan management direction for the area.

Because this unroaded area does not meet the criteria for potential wilderness designation, Alternative 4 would not reduce the existing capability of this area's suitability for wilderness recommendation. In other words, neither this unroaded area nor the portions of the adjacent inventoried roadless area indirectly affected by the activities are considered suitable for future wilderness designation and both would remain unsuitable after project implementation.

Jericho Mountain IRA (1607)

Natural

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes (2.4 miles)would enhance the apparent naturalness of the IRA. In addition, the reduction in acres open to OSMV would add to the apparent naturalness.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the opportunities for solitude in the IRA. In addition, the reduction in acres open to OSMV would add to the opportunities for solitude.

Special Features and Values

The CDNST passes through the west side of this IRA. There are no changes proposed to the CDNST. The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 4 on this portion of wilderness criteria.

Manageability

Because much of this IRA is already bordered by roads, private lands, and trails, the proposed changes under Alternative 4 would not affect the manageability of the IRA.

Lazyman (1608)

Alternative 4 proposes no changes to the existing condition. Please see the description above.

Electric Peak IRA (1609)

Natural

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the apparent naturalness of the IRA. There would be no change in the number of acres available to OSMV. Therefore, the effects to the apparent naturalness would not change.

Undeveloped

Because there would be no physical changes to the landscape, the undeveloped character would remain the same.

Outstanding opportunities for solitude or primitive unconfined recreation

The reduced presence of highway and wheeled vehicles due to fewer miles of wheeled motorized routes would enhance the opportunities for solitude in the IRA. Since the number of acres available to OSMV would remain the same, the impacts from those types of vehicles would not change.

Special Features and Values

Access into the Electric Peak IRA for OSMV would not change.

There are no changes proposed to the CDNST.

The area is comprised of forested slopes similar to many other areas on the Helena Ranger District, so there would be no effect from implementation of Alternative 4 on this portion of wilderness criteria.

Manageability

The majority of this IRA in the project boundary is bordered by roads and topographic features. The proposed changes under Alternative 4 would not affect the manageability of the IRA.

Conclusions

Alternative 1 would not alter the existing conditions of the 4 IRAs and the one contiguous unroaded area.

All the action alternatives would improve the five wilderness characteristics of the unroaded areasin some of the IRAs. Reducing the number of acres open to OSMV and the number of miles of wheeled motorized routes would improve the perception of natural integrity, undeveloped characteristics, opportunities for solitude, and special features. The manageability of the areas would not substantially change because of the existing roads, private lands, mining claims, and topography. However, Alternative 3 would reduce the number of wheeled motorized routes within the IRAs more than any of the other alternatives – including the No Action Alternative. In summary, all of the action alternatives would improve the overall roadless character of unroaded lands.

Please see the following tables for comparisons of the alternatives.

Table 3.9 Nevada Mountain IRA by Alternative

Road, Trail or General Area	Changes			
	From Existing Condition	**To Alt. 2**	**To Alt. 3**	**To Alt. 4**
Road 4044 E1	Roads closed to motorized vehicles yearlong including OSMV	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)
Road 136 D1 (portion of)	Roads open to highway legal vehicles, no seasonal	Roads closed to wheeled motorized use yearlong, open to	Roads closed to wheeled motorized use yearlong, open to	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 –

Road, Trail or General Area	Changes			
	From Existing Condition	To Alt. 2	To Alt. 3	To Alt. 4
	restrictions	OSMV 12/2 – 5/15	OSMV 12/2 – 5/15 (same as Alt.2)	5/15 (same as Alt.2)
Trail 136-007 (not in IRA, but adjacent to it)	Unauthorized road/trail	Trail open to vehicles 50" or less in width, no seasonal restrictions	Trail open to vehicles 50" or less in width, no seasonal restrictions (same as Alt.2)	Trail open to vehicles 50" or less in width from 5/16 – 10/14
Over Snow Motorized Vehicles (southwest portion of IRA)	Open to OSMV – 8,435 acres open to OSMV	Area restriction to OSMV except on open or designated routes- 7,430 acres open to OSMV	Most of the area restricted to OSMV – 682 acres open to OSMV	Area restriction to OSMV except on open or designated routes – 7,430 acres open to OSMV

Table 3.10 Jericho Mtn IRA by Alternative

Road, Trail, or General Area	Changes			
	From (Existing Condition)	To (Alt. 2)	To (Alt. 3)	To (Alt. 4)
Over Snow Motorized Vehicles	Open to OSMV – 8,438 acres open to OSMV	Open to OSMV 12/2 – 5/15, 2,390 acres open to OSMV	Open to OSMV 12/2 – 5/15, 2,390 acres open to OSMV	Open to OSMV 12/2 – 5/15 (same as Alt.3), 2,390 acres open to OSMV
Over Snow Motorized Vehicles (northeast 1/3)	Open to OSMV	Restricted except on open or designated routes	Restricted except on open or designated routes	Restricted except on open or designated routes (same as Alt.3)
Road 527 B1	Road open to highway legal vehicles, no seasonal restrictions	Road closed to wheeled motorized use yearlong, open to OSMV from 12/2 – 5/15	Road closed to wheeled motorized use yearlong, open to OSMV from 12/2 – 5/15 (same as Alt.2)	Road closed to wheeled motorized use yearlong, open to OSMV from 12/2 – 5/15 (same as Alt.2)
General Access Into IRA via 1017	Roads open to wheeled motorized	Roads open to highway legal vehicles 5/16 –	Roads open to highway legal vehicles 5/16 –	Roads open to highway legal vehicles 5/16 –

Road, Trail, or General Area	Changes			
	From (Existing Condition)	To (Alt. 2)	To (Alt. 3)	To (Alt. 4)
and 1016	vehicles 5/16 – 4/14, open to OSMV, no seasonal restrictions	12/1, open to OSMV 12/2 – 5/15	12/1, open to OSMV 12/2 – 5/15 (same as Alt.2)	12/1, open to OSMV 12/2 – 5/15 (same as Alt.2)
			Roads closed to motorized vehicles yearlong including OSMV	Roads closed to motorized vehicles yearlong including OSMV (same as Alt.3)

Table 3.11 Electric Peak IRA by Alternative

Road, Trail, or General Area	Changes			
	From (Existing Condition)	To (Alt. 2)	To (Alt. 3)	To (Alt. 4)
Road 227 C1	Roads closed to motorized vehicles yearlong including OSMV	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)
Road 227D1	Roads open to highway legal vehicles with no seasonal restriction	Roads closed to motorized vehicles yearlong including OSMV	Roads closed to motorized vehicles yearlong including OSMV (same as Alt.2)	Roads open to highway legal vehicles with no seasonal restriction
Road 227 E1	Roads open to highway legal vehicles with no seasonal restriction	Roads open to highway legal vehicles with no seasonal restriction	Road closed to motorized vehicles yearlong including OSMV	Road closed to motorized vehicles yearlong including OSMV
Road 1801A	Roads closed to motorized vehicles yearlong including OSMV 3.1 total miles	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15, (1.45 miles)	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2), (1.45 miles)	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2), (1.45 miles)

Road, Trail, or General Area	Changes			
	From (Existing Condition)	To (Alt. 2)	To (Alt. 3)	To (Alt. 4)
Road 1870 (portion)	Roads open to wheeled motorized vehicles 6/1 – 8/31, open to OSMV 12/1 – 8/31	Roads open to highway legal vehicles 5/16 – 10/14, open to OSMV 12/2 – 5/15	Roads closed to wheeled motorized vehicles yearlong, open to OSMV 12/ - 5/15	Roads open to highway legal vehicles 5/16 – 10/14, open to OSMV 12/2 – 5/15
Road 1870 A1	Roads open to highway legal vehicles with no seasonal restrictions	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)
Road 1870 B1	Roads closed to motorized vehicles yearlong including OSMV	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)	Roads closed to wheeled motorized use yearlong, open to OSMV 12/2 – 5/15 (same as Alt.2)
Road 501	Road open to vehicles 50” or less in width, no seasonal restrictions	Trails open to 50” or less in width 5/16 – 10/14	Trails closed to motorized vehicles yearlong except in areas open to OSMV	Trails closed to motorized vehicles yearlong except in areas open to OSMV
Trail MTR 502	Trails open to vehicles 50” or less in width 5/16 – 10/14	Trails open to vehicles 50” or less in width 5/16 – 10/14	Trails closed to motorized vehicles yearlong except in areas open to OSMV	Trails closed to motorized vehicles yearlong except in areas open to OSMV
Trail MTR 503	Trails open to vehicles 50” or less in width 5/16 – 10/14	Trails open to vehicles 50” or less in width 5/16 – 10/14	Trails closed to motorized vehicles yearlong except in areas open to OSMV	Trails closed to motorized vehicles yearlong except in areas open to OSMV
MTR 504	Trails open to vehicles 50” or less in width 5/16 – 10/14	Trails closed to motorized vehicles yearlong, except in areas open to OSMV	Trails closed to motorized vehicles yearlong except in areas open to OSMV (same as Alt.2)	Trails closed to motorized vehicles yearlong except in areas open to OSMV (same as Alt.2)

Table 3.12 IRAs and Acres Open to Over Snow Vehicles

Inventoried Roadless Area	Appx. Acres of NF in Planning Area	Acres Open to Over Snow Motorized Vehicles w/n IRA			
		Alt 1	Alt 2	Alt 3	Alt 4
Nevada Mountain	8,435	8435	7430	682	7430
Jericho Mountain	8,438	8438	2390	2390	2390
Lazyman	11,503	0	0	0	0
Electric Peak	27,851	9550	9550	9550	9550

Table 3.13 IRAs and Miles of Wheeled Motorized Routes

Inventoried Roadless Area	Appx. Acres of NF in Planning Area	Miles of Wheeled Motorized Routes w/n IRA			
		Alt 1	Alt 2	Alt 3	Alt 4
Nevada Mountain	8,435	2	0.07	0.01	0.07
Jericho Mountain	8,415	4.11	2.4	2.4	2.4
Lazyman	11,503	0.08	0.08	0.08	0.08
Electric Peak	27,851	7.2	4.93	0.08	0.49

Forest Plan Consistency

As previously stated, the Divide travel planning area was assigned management area designations which allow for wheeled motorized routes and OSMV. All alternatives are consistent with the Forest Plan in this regard. All alternatives are consistent with Forest Plan forest-wide and management area standards. All effects were found to be consistent with Forest Plan standards and would not harm or erode the identified wilderness characteristics of these unroaded areas.

This analysis would also be consistent with the 2001 Roadless Rule in that it does not propose or authorize the construction or reconstruction of roads within designated IRAs. The analysis only evaluates the opportunities to designate existing routes for motorized travel.

TRANSPORTATION

Regulatory Framework

Transportation management regulations for the National Forest System are located in the 36 Code of Federal Regulations parts 212 (forest transportation system) and 295 (use of motor vehicles off forest roads). Management policy direction and guidelines are contained in Forest

Service Manuals (FSM) and Handbooks (FSH), including FSM 7700 (transportation system) and FSH 7709 (transportation). Management direction specific to the Helena National Forest is also provided by the 1996 Helena Forest Plan.

Assumptions

The transportation system in the Divide Area has evolved from a variety of past activities including mining, logging, grazing and recreational use. Over the past 30 years the majority of new road construction has been driven by timber harvest. It is assumed that these activities will continue to shape the transportation system with recreation, commercial and administrative uses being the primary drivers for change.

It is assumed that the use of the transportation system will trend upward. There are no firm numbers to confirm this trend, but personal observations, comments by forest users and adjacent landowners as well as the increasing population in the area indicate that use will increase. It is also assumed that maintenance on the transportation system would continue to lag behind needs.

In all four alternatives, roads and trails cross private land where there is no recorded easement. To ensure that these routes remain open to both administrative and public use, easements need to be obtained from the land owners.

It is assumed that the current maintenance activities would continue as they have in the recent past. Traffic service levels for the Divide transportation system are adequate for the amount of traffic occurring and are expected to continue to provide adequate service into the future, accounting for area population growth and potential displacement.

Information Used

The roads and trails in the Divide Area are identified on a GIS spatial layer. Information about the system roads and trails is stored in a database that is linked to the spatial layer. Non-system roads and trails have basic information stored in a data table linked to the spatial layer.

Information about the transportation system was derived from the following sources:

- Helena NF Roads Analysis, Final August 2004
- Helena NF Travel Routes INFRA 2009
- Off-Highway Vehicles EIS for MT, MD, and SD, 2001
- Elkhorn Mountains Travel Plan, 1995
- North Belts Travel Plan, 2005
- South Belts Travel Plan, 2008
- Helena National Forest Roads Analysis Process 2004
- USFS Travel Routes Data Dictionary
- Field reviews conducted by Interdisciplinary team (IDT) members in 2008
- Professional experience by Helena National Forest personnel.
- Spreadsheets of Roads/Trails data developed by the Helena National forest

In this report the description “unauthorized” road or route is equivalent to “non-system” route in INFRA. Much of the information presented in this analysis comes directly from field examination of the planning area and the surrounding region.

Roads Analysis Process (RAP)

The Helena Roads Analysis Plan (2002-2004) (RAP) was used to inform this process. Since 2004 there have been updates and corrections to the roads database. This corrected data was given more consideration during this analysis than the RAP.

The Helena NF Roads Analysis Process divided all of the roads in the area into nine categories (combinations of high, medium or low value and high, medium or low concern). A map showing the roads by category for the Divide Area is in the roads analysis document (Final, August 2004). In addition to categorizing the roads in the Divide area, the Roads Analysis Process identified a minimal roads system necessary for Helena National Forest operation. The minimal roads system identifies the roads necessary to meet the agency mission of protecting resources, providing adequate access for the public while considering impacts on global climate change. One aspect of the Divide travel planning process is to verify the information in the Roads Analysis Process as well as determine appropriate long term management of undetermined and user created routes that may not have been identified during the Roads Analysis Process. Necessary changes to the minimum roads system were made in conjunction with the additional analysis completed as part of this travel planning effort.

The roads analysis recommends that roads rated low value-high concern (LVHC) be removed from the road system. There are two roads in this area that were classified in the roads analysis as LVHC – Road 527-C1 and road 4044 E-1.

Methodology and Scientific Accuracy

To identify the type of use on each route, each road was assigned an Access and Travel Management (ATM) code and has a corresponding map code which is reflected on the map legends. Each ATM code is for Forest Service inventory purposes only. There is a route-by-route table in Appendix E.

Please also see the Roads Analysis Process described above.

Transportation, Affected Environment

Introduction

The transportation system existing condition was developed using transportation planning data from the sources listed previously. This data was used to evaluate the effects of each alternative and was based on information dated 07/05/2012 with updates to trails information on 11/22/2012 and 6/6/2012. The information in the roads inventory is constantly being updated and corrected. All mileages in this report are approximate.

The Divide area is accessed by an extensive road and trail system. Most of the early roads were developed primarily for mining and grazing activities. Many of these roads were first used in the mid – 1800’s as wagon roads and then improved in the early 1900’s to accommodate motorized vehicles. Since the 1950’s, roads have been built to access forest stands for commercial timber sales. These roads have been built to a higher standard than the old mining and grazing roads.

The road system now consists of a mixture of old and new roads, with many of the older roads in disrepair. See the Heritage Resources Specialists Report for more detailed information regarding historical development of the areas road and trail network.

Analysis Area

The analysis area is presented both in terms of the condition of the transportation system as well as specifics as they relate to certain geographic areas within the Divide travel planning area.

Transportation System

The majority of the roads are single-lane, native surface roads. Within the analysis area, there are roads under the jurisdiction of counties, the State, private landowners, and the Forest Service. These roads are included as part of the analysis and on the maps where they are the connectors between other primary forest roads.

Road Maintenance

Road maintenance is performed annually on the main county/state and NFSR's and sporadically on all of the other roads. Some of the roads are in poor locations (i.e. narrow canyon bottoms which increase both maintenance needs and the risk that sediment from the road surface could enter adjacent streams). Many of the local and collector roads in the area receive little maintenance.

Maintenance Level

There are 5 levels of maintenance identified by the Forest Service on National Forest System Roads (NFSR).

- Maintenance Level 1 roads are closed roads that receive minimal custodial maintenance (drainage). This operational maintenance level indicates roads that are closed to all wheeled vehicles. Roads with a Maintenance Level 1 may be open to over-snow travel depending on the Access and Travel Management Code applied to the road. Refer to Appendix A, Table 3 for a description of the travel management codes.
- Maintenance Level 2 is assigned to roads that would generally require a high clearance vehicle to drive them. Maintenance activities on level 2 roads are primarily limited to drainage management.
- Maintenance Level 3 roads tend to be low speed, single lane roads with turnouts with little or no surfacing that can often be used by passenger cars.
- Maintenance Level 4 roads are typically wider and may have sections of two-lanes. They are surfaced and can accommodate higher speed and traffic volumes.
- Maintenance Level 5 roads generally are paved two-lane roads.

Many of the roads in the Divide Area lie in and out of private jurisdiction. In many cases where the private land intersects National Forest land the assigned maintenance level is carried through uninterrupted in the database. That may or may not be accurate in all cases. ROW information is currently being reviewed.

In the Divide area there are approximately 36 miles of maintenance level 4 roads maintained by the Forest Service and one maintenance level 5 road which is located in a campground. Maintenance Level 4 roads on the forest include the Ten Mile road, Little Blackfoot, Priest Pass, Elliston-Spotted Dog, Frontier Town, and Moose Creek Campground and McDonald Pass Vista. There are approximately 87 miles of Maintenance Level 3 roads in the Divide Area which include

Snowshoe, Greenhorn Mountain, Dog Creek, Banner Creek and Clarks Canyon. There are approximately 209 miles of Maintenance Level 2 roads in this area.

Functional Class

The roads are divided by Functional Class where an arterial road is a high capacity forest road that is used to deliver traffic to and from collector roads throughout the national forest, a collector road is a road that is used to deliver traffic to and from local roads to arterial roads and local roads are low capacity roads that carry low volumes of traffic to and from collector roads. The miles of roads by Functional Class in the Divide area are as follows:

- Arterial- Road 218-Ten Mile Road is classified as an arterial (6.759 Miles)
- Collector - Approximately 213.87 miles are classified as collector roads
- Local - Approximately 363 miles are classified as local.

Unauthorized Roads

There are approximately 16 miles of non-system roads in the Divide travel planning area identified by the Inter Disciplinary Team (ID T) or by permittees and other users during collaborative field review activities in 2008. Most of the routes identified were created by full-size vehicles. Many of these routes originate from private land and therefore are not accessible to forest users. As part of the travel planning process, roads that would fall under Forest Service jurisdiction or those that could potentially have easement accesses obtained by the Forest Service are being considered for inclusion in the National Forest System of Roads.

Continental Divide National Scenic Trail (CDNST)

The CDNST is a route within this travel planning area made up of a combination of both motorized and non-motorized routes. A map showing how the CDNST lays on the land is located in the map packet and a table describing the alternatives is included in the recreation section of this chapter.

Road Closures

Since adoption of the Helena Forest Plan in 1986, roads have been closed across the forest and in the Divide area for a variety of reasons. Closures are often with gates but have also been done by contouring, barrier placement, and ripping/seeding. Currently, many NFSR in the Divide areas are closed yearlong (about 126 miles) to wheeled motorized vehicles. These closures have occurred in the past 25 years almost entirely associated with timber harvest. Other NFSR roads in the area are closed to motor vehicle use for at least a portion of the year. These seasonal closures are either spring closures to protect the road surface from rutting during the wet time of the year, or hunting season closures to provide big game security during the general rifle season.

Road closures are discussed in more detail under the following geographical areas within the Divide planning area:

Area 1 - Northwest-Dog Creek-Ophir Cave Area

Area 2 - North Central-Sweeny Creek Area

Area 3 - Southwest – Kading Area-West of Telegraph Road

Area 4 - Southeast-Banner-Rimini Area- East of Telegraph Road

Road Conditions

Most routes are in fair to good condition with some individual routes in poor condition. Road conditions vary across the Divide area with many factors influencing route surfaces including amount of use, type of use, maintenance level, type of surface and weather. The Helena National Forest spends approximately $20,000 on maintenance in the Divide area. Although the Forest Service experienced a recent surge in funding due to American Recovery and Reinvestment Act of 2009 it is anticipated that funding for roads maintenance would greatly decrease in the future and the amount of money available for maintenance in the Divide area would potentially decrease. The $20,000 does not allow the forest to meet what would be considered minimum maintenance on the open roads.

Enforcement

User compliance of Forest regulations on roads and trails is generally related a users understanding of the sign system and available maps. The Helena National Forest has identified that the complexity of its current visitor use map is high, resulting in confusion for forest users and violations of regulations. New travel plans for the Helena National Forest deliberately reduce the number of seasonal closure periods and have not specified trail types beyond motorized and non-motorized types of trails open to wheeled motorized use 50" in width and less. Non-motorized trails would be available for all types of non-motorized, appropriate uses. Motorized trails would be available for vehicles 50 inches or less in width, as well as non-motorized uses. Conflicts between uses have not been documented to a level that would warrant more exclusive designations for route use.

Specific travel plan related law enforcement issues include off road use by OHVs and full-size vehicles, youth party areas, woodcutting road proliferation, and dropping bug kill logs within the road prism and leaving the limbs – along with the associated garbage, damage, and drainage problems. Off-route use and woodcutting road proliferation are the more problematic issues tied to travel planning. Numerous incident reports stem from paintball activity, litter, damage to government property, and concerns about the paint causing resource damage.

Specific Geographic Areas within the Divide Planning Area

The analysis area is also presented in four distinct geographic areas, with specifics pertaining to each area. The areas are:

- Area 1 - Northwest-Dog Creek-Ophir Cave Area
- Area 2 - North Central-Sweeny Creek Area
- Area 3 - Southwest – Kading Area-West of Telegraph Road
- Area 4 - Southeast-Banner-Rimini Area- East of Telegraph Road

Area 1 - Northwest-Dog Creek-Ophir Cave Area

Transportation System

The main road through the west side of Area 1 is NFSR 136 Ophir Cave. This is a maintenance level 3 road that is open with no restrictions. There are many spur roads along Ophir Cave road that are closed year-long. These spur roads were originally constructed for timber harvest. Ophir Cave road also provides access to the Continental Divide National Scenic Trail (CDNST) as well as private land.

The primary road on the east side of Area 1 is NFSR 1855, Dog Creek Road, which is also a maintenance level 3 road. The majority of the roads in the Dog Creek Area are open with no restrictions; however, many of the roads in this area that cross private land do not have easements in place. The Dog Creek road and spurs also provide access to the CDNST and private land within the National Forest boundary.

Road Conditions

The open and closed roads in Area 1 are in adequate surface and drainage condition, with the exception of the Dog Creek road where sections of the road are in need of drainage work and surfacing. Most of the road miles in this area are single lane with turnouts. The road locations are generally good, and the roads were designed with drainage features. The main roads receive sporadic maintenance.

Enforcement

There are no major enforcement problems in the Ophir Cave-Dog Creek Area. There is evidence of OHV/pickup use on some closed roads and trails, but few user created routes have been observed in this area.

Area 2 - North Central-Sweeny Creek Area

Transportation System

NFSR 335-Priest Pass Road provides access to the Continental Divide Trail. There are non-system roads in this area. Road 1860 Sweeny Creek Road crosses a small section of private land. There is a Forest Service easement in place for this area.

Road Conditions

With the exception of Road 335-Priest Pass (a Maintenance Level 4 road), and the Maintenance Level 3 Road 1898 Gravel Pit Road (the road to the shooting range), the open roads in this area are maintenance level 2. The roads in this area were constructed with drainage features. Most of the road miles in this area are single lane with turnouts. The main road receives sporadic maintenance.

Enforcement

Law enforcement problems in this area include wood cutting and issues associated with paint ball. There has been an increase of woodcutters in this area dropping trees within the road prism. It appears to be more prevalent in this area when compared to other areas primarily because of the close, easy access from the city of Helena (large population base) responding to the recent substantive tree mortality due to insect infestation. Numerous incident reports stem from paintball activity in the area - litter, damage to government property, and concerns that paint causes resource damage.

Area 3 Southwest – Kading Area-West of Telegraph Road

Transportation System

The Kading area has an extensive system of roads with the primary roads being NFSR 1870-Baldy Ridge (ML 2), 227-Little Blackfoot (ML 4) and 495-Telegraph (ML 3). These roads access the Continental Divide Trail as well as a system of non-motorized trails in the Little Blackfoot Meadows area. All three of the main roads travel in and out of private and county jurisdiction. The first 3.96 miles of NFSR 227 and the first 2.305 miles of NFSR 495 are county jurisdiction maintained by Lewis and Clark County. The majority of the roads passing through private land in

this area do not have easements in place. There are several spur roads that were built for timber harvest that are closed year long.

Road Conditions

The primary roads in this area are in good shape. The roads are constructed with drainage features and are maintained through a sporadic maintenance program. It is common for the spur roads in this area to have a substantial amount of rutting and drainage problems.

Enforcement

There is a considerable amount of dispersed camping in this area. There is evidence of minor OHV/pickup use on some closed roads and trails. Few user-created routes have been observed in this area.

Area 4-Southeast-Banner Creek-Rimini Area- East of Telegraph Road

Transportation System

In the Banner Creek-Rimini area the primary roads are 495-Telegraph and County Road 695-Rimini Road. These roads access the Rimini townsite and multiple active and abandoned mine sites on the forest. The majority of the roads in this area are open with no restrictions. Spurs off Road 495 provide access to the Continental Divide trail (CDNST).

Road Conditions

The primary roads in this area are in good condition. The Rimini road is maintained by Lewis & Clark County. The roads are constructed with drainage features and are maintained through a sporadic maintenance program.

Enforcement

There is a considerable amount of dispersed camping that takes place in this area. There is evidence of minor OHV/pickup use on some closed roads and trails, but few user created routes have been observed in this area.

Transportation, Environmental Consequences

Alternatives were evaluated on the following basis:

- Transportation System - how the alternative changes the open transportation system, and ability to conduct maintenance, including management of unauthorized (non-system) roads.
- Road Conditions – whether or not the alternative affects road/trail conditions.
- Enforcement issues - complexity of travel maps due to seasonal closures and vehicle types, areas of enforcement problems, and conflicts between uses and the differences between the alternatives.

Effects Common to All Alternatives

The roads analysis recommends that roads rated low value-high concern (LVHC) be removed from the road system. However, Road 527-C1 would remain open for over-snow motorized use in all four alternatives.

Effects common to all alternatives include maintenance levels and costs.

Few if any of the maintenance level 3, 4, and 5 roads would be closed with Alternatives 2, 3 or 4. Thus maintenance costs and backlog would largely be the same for all alternatives.

None of the alternatives provide for Mixed Motorized Use on NFSR for Off Highway Vehicles (OHV) that are not "street legal". Mixed Motorized Use requires an engineering evaluation and recommendation, not an environmental evaluation (NEPA). Mixed Motorized Use evaluations would be conducted following the project decision and would occur incrementally. There are numerous route miles that could be candidates for mixed motorized use in the Divide area. This does not change between alternatives.

Road Conditions

Trends for future maintenance dollars do not show substantial change from the current amount, however, future proposed projects may provide additional opportunities for road improvements.

Cumulative Effects

None of the routes are currently operating near capacity. There are several factors that could result in an increase in road use in the Divide area. For example:

- Closures resulting from planning efforts on other parts of the Helena National Forest may shift some traffic to the Divide area.
- The Divide area is easily accessible. An increase in use may eventually trigger a need for a higher traffic service level on some roads attributed to continued population growth in the Helena area.
- There may be an increase in activities resulting from roads and facilities improvements. For example, Rimini Road is scheduled to be paved in 2013.

Past travel management decisions in the surrounding National Forest areas have closed many roads and trails on public land to motorized vehicles. The road and trail closures in the Elkhorn Mountains, North Belts and in surrounding National Forest have resulted in an increase in some non-local users including Gallatin and Lewis and Clark counties using the Divide area of the Helena National Forest for recreational purposes. In addition, the increase in local populations and enhanced dependability of trucks and other OHV's has also resulted in increased use on the roads and trails in this area, but at this time, the traffic increase has not adversely affected the traffic service levels on any of the forest roads or trails. Traffic use tends to be higher during summer holiday weekends and around the opening of big game rifle season. Multi-State OHV Decision of 2001 restricted wheeled motorized vehicles to existing roads and trails. This decision also did not affect the traffic service levels in the planning area.

Past management activities within the Divide area such as timber and grazing management, fire and watershed restoration efforts have affected the transportation system in the short term by temporarily closing a section of road for several days or weeks. Upon opening the roads, the effects disappeared immediately. Some roads in the Divide area have been closed as mitigation for timber sales, but since there are alternate routes to most of the areas accessed by the closed roads, there has been limited loss of public access to National Forest Land.

Effects Common to All Action Alternatives

Enforcement/Complexity

Summer type wheeled vehicle use restrictions have been reduced but there is an added layer of over-snow motorized vehicle use restrictions. There would be an increased need for law enforcement in the short-term to patrol the roads that would be closed to wheeled motorized use.

Alternative 1, No Action

Direct and Indirect Effects

The roads analysis recommends that roads rated low value-high concern (LVHC) be removed from the road system. However, Road 4044-E1 would be open to over snow access.

Open/Closed Routes

Spring closures would continue to occur resulting in road closures being in place until as late as June 1st regardless of road conditions. In addition to the above Area descriptions, please see Please see Appendix E for more specific information.

In all 4 areas there are seasonal closures that allow for over-snow travel on some routes.

Area 1 – Designated routes in parts of Area 1 would be open year long.

Continental Divide National Scenic Trail (CDNST) Routes 136-D1 is open to motorized use year-long.

Area 2 - Routes 335-A1 and A2 are closed year-long to wheeled vehicles.

Continental Divide National Scenic Trail (CDNST) – Route 1802-B2 is open to motorized use year-long.

Area 3 -There is a winter closure from October 15 to December 2 for the Limburger Springs/Spotted Dog Areas. The Little Blackfoot area has a seasonal closure of October 15 to December 2 for everything south of the Little Blackfoot Road and west of the Ontario Creek Road.

Routes in parts of Area 3 near the Limburger Spring/Kading area are open to over-snow motorized vehicles from December 1 to October 14. Routes 314, 314-J3 and 314-J1 have seasonal restrictions.

Hunting season access route 314-J3 is closed year-long to wheeled vehicles.

Area 4 - Hunting season access route 1856 is closed year-long to wheeled vehicles.

Unauthorized Routes

Under Alternative 1 there are 16 miles of road that are unauthorized and are open year-round to highway legal vehicles. Non-system routes in Alternative 1 would keep their current status as open to travel in accordance with the 2001 Tri-State OHV EIS for MT, ND, and SD. Exclusive access across forest routes to access private land would continue under a special use agreement. Creation of new unauthorized routes would likely occur at a low rate with violators subject to citation.

Enforcement/Complexity

Travel management for this alternative is moderately complex. There are several restriction codes governing the use of the roads and trails in this area and in many instances all existing roads and trails are open to motorized vehicles, including unauthorized routes, based on the 2001 Tri-State OHV Decision. Effective enforcement of the existing travel plan is difficult due to complexity of closure types and lack of a site specific road-trail decision.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments associated with Alternative 1.

Cumulative Effects

The general cumulative effects are described in the section under Common to All Alternatives.

The cumulative effects of this project in relation to others are projected to be as follows:

- The Divide area is currently being managed for the removal of Hazard Trees. This involves removal of beetle killed trees within one and one-half tree length along the major roads as well as along some of the spur roads throughout the planning area which will cause a temporary increase in traffic to the area, impacting the road conditions and therefore may increase the need for maintenance. Also, the removal of a substantial number of trees could potentially increase the drainage to the road drainage structures.
- The foreseeable action to improve the Ten Mile Complex roads (including Rimini Road) could potentially result in an increase in cumulative effects in this area because an improvement to the condition of the roads would result in an increase in traffic to this area.

Alternative 2

The biggest change from Alternative 1 to Alternative 2 is the substantial reduction in the number of roads that are closed year long. Most of the roads that would be closed yearlong are classified as open to over-snow vehicles use during the winter in Alternative 2 but are closed to all other motorized vehicles. Motor vehicle use maps that identify routes and designations for motorized use within the planning area would be available to the public.

The roads analysis recommends that roads rated low value-high concern (LVHC) be removed from the road system. Road 4044-E1 would remain closed in Alternative 2.

Direct and Indirect Effects

Open/Closed Routes

Spring closures would be implemented as needed. The public would be informed by signage and information published by the Public Affairs Office. There would be an increase in the number of roads open for over-snow vehicle use as compared to Alternative 1. Under Alternative 1, the area on either side of the closed road prism is open to cross-country over-snow motorized vehicle travel. Alternative 2 identifies these roads as open for over-snow motorized vehicles to be consistent with the designated use of the surrounding landscape. All other motorized use would continue to be restricted from routes when groomed. The majority of these roads are located north of route 136 in the upper northwest corner of the planning area.

Please see Appendix E for more specific information.

Some specifics in key areas are as follows:

Area 1 - CDNST – Road 136-D1 would be closed to wheeled motorized vehicles.

Area 2 - Sweeny Creek – The designated trail system would be open from 5/15-10/15 for wheeled motorized vehicles 50 inches or less in width. There would be additional winter closures in the Sweeny Creek area. Those areas that remain open have a season of 12/2-5/15 for over-snow motorized vehicle travel.

There would be additional winter closures in the lower elevation west facing slopes Clarks Canyon north to Threemile Creek. Those areas that remain open have a season of 12/2-5/15 for over-snow motorized vehicle travel.

CDNST – Roads 1802-B2, 335-B2 would be closed to wheeled motorized vehicles.

Hunting Season Access – Roads 335-A1 & A2 would be open to wheeled motorized vehicle use 10/15-12/1.

Area 3 - Limburger Spring/Kading/Elliston – The connection between Road 314 and 1870 would be open to motorized use 5/15-10/15. Road 314-J3 would be open 10/15-12/1. Road 314-J1 would be open year-long. Trails 501, MTR's 503, 502, and 1868, and road 1871-002 would be open to wheeled motorized vehicles less than 50 inches in width from 5/15-10/15.

Negro Mountain. – Road 1857-A1 would be open from 5/15-10/15, Road 1857-B1 would be closed year long. Roads 1857 D-1 and 1859-D4 and E1 would be open year-long.

Ontario Creek – A connection for wheeled motorized vehicles 50 inches or less in width would be open from the 491-D1 road to the 4104-A1 road. This route would be open from 5/15-10/15.

Hunting Season Access – Road 314-J3 would be open to wheeled motorized vehicle use 10/15-12/1.

Area 4 - There would be additional winter closures in the Hahn Creek areas. Those areas that remain open have a season of 12/2-5/15 for over-snow motorized vehicle travel.

Hunting Season Access – Road 1856 would be open to wheeled motorized vehicle use 10/15-12/1.

Unauthorized Roads

Alternative 2 would incorporate approximately 10 of the 16 miles of non-system routes into the forest's system of roads and trails. These roads would be assigned travel management codes. The remaining roads would continue to be classified as closed non-system roads. .

Road Conditions

There are four roads that cross live streams. These fords would be closed until suitable crossings (such as a bridge, bottomless arch, or culvert) are in place.

Irreversible and Irretrievable Commitments

There are no irreversible or irretrievable commitments as a result of implementing this alternative.

Cumulative Effects

The previous actions that improved trails in this area combined with the foreseeable action to improve the Ten Mile Complex roads (Area 4) would result in an increase in traffic to this area.

Additional impacts due specifically to this alternative would be minimal because this alternative would result in an increase in use during the winter months which results in no additional maintenance to the roads system. Foreseeable projects that would be put in place for vegetation management due to tree mortality may require small amounts of temporary new road construction. Any effects would be temporary.

Alternative 3

Direct and Indirect Effects

The roads analysis recommends that roads rated low value-high concern (LVHC) be removed from the road system. Road 4044-E1 would be open to over snow access.

Open/Closed Routes

The most notable difference between Alternative 1 and 3 is the substantial reduction in the number of roads that are closed year long. Most of the roads that were closed year-long are classified as open to over-snow vehicles use during the winter but still closed to all other motorized vehicles.

Alternative 3 would increase the number of miles that are closed year-long in comparison to Alternative 2. Similar to Alternative 2, it opens road prisms to over-snow motorized vehicle use as to be consistent) with the area surrounding the road that is already open for that type of use.

Please see Appendix E for more specific information.

Some specifics in key areas are as follows:

Area 1 - CDNST road 136-D1 would be closed to wheeled motorized vehicles year-long.

Area 2 - Roads and trails in the Sweeny Creek area would be closed year-long to wheeled motorized vehicles. Those areas that remain open have a season of 12/2 to5/15 for over-snow travel.

There would be winter closures in the Sweeny Creek area.

There would be winter closures in the lower elevation west facing slopes Clarks Canyon north to Threemile Creek (Area 2). Those areas that remain open have a season of 12/2 to 5/15 for over-snow travel.

Hunting season access routes 335-A1 and A2 would be closed year-long to wheeled motorized vehicles.

CDNST roads 1802-B2 and 335-B2 would be closed to wheeled motorized vehicles year-long.

Area 3 - Limburger Spring/Kading – Little Blackfoot Road (NFSR 227) would be closed just past the Campground and in this alternative NFSR 227-E1 would be closed to wheeled motorized vehicles. Road 314 would be closed year-long to wheeled vehicles past the gate in Section 7. Roads 314-J1 and J3 would also be closed year-long to wheeled vehicles. Trails 501, MTR's 503, 502, and 1868, and road 1871-002 would be closed year-long to wheeled motorized vehicles.

Negro Mtn. – 1857 –D2, and 1859 D4, and E1 would be closed year-long to wheeled motorized vehicles.

Ontario Creek – The connection from 491-D1 and 4104-A1 would be closed year-long to wheeled vehicles.

Hunting season access route 314-J3 would be closed year-long to wheeled motorized vehicles.

Area 4 - The area south of MacDonald Pass to approximately the Hahn Creek Road would be closed to wheeled and motorized over snow vehicle travel. Those areas that remain open have a season of 12/2 to 5/15 for over-snow travel.

Hunting season access route 1856 would be closed year-long to wheeled motorized vehicles.

There would be winter closures in the Hahn Creek area.

Unauthorized Roads

Approximately 9 of the 16 miles of non-system routes would be incorporated into the existing system of NFSRs.

Irreversible and Irretrievable Commitments

There are no irreversible or irretrievable commitments as a result of implementing this alternative.

Cumulative Effects

The cumulative effects of this alternative are projected to be the same as Alternative 2.

Alternative 4

Direct and Indirect Effects

The roads analysis recommends that roads rated low value-high concern (LVHC) be removed from the road system. Road 4044-E1 would be open to over snow access.

Open/Closed Routes

The most notable change from Alternative 1 to Alternative 4 is the substantial reduction in the miles of roads that are closed year long. Most of the roads that were closed year-long (as clarified above) would be classified as open to over-snow vehicles use during the winter but still closed to all other motorized vehicles.

Alternative 4 would increase the number of miles that are closed year-long in comparison to Alternatives 2 and 3. Alternative 4 is more similar to Alternative 3 than to Alternatives 1 and 2. As with Alternatives 2 and 3, Alternative 4 would open road prisms to over-snow motorized vehicle use to be consistent with the area surrounding the road that is already open for that type of use. Please see Appendix E for more specific information.

Some specifics in key areas are as follows:

Area 1 – CDNST road 136-D1 would be closed to wheeled motorized vehicles year-long.

Area 2 - Sweeny Creek – Roads and trails would be closed year-long to wheeled motorized vehicles.

There would also be winter closures in the Sweeny Creek. Those areas that remain open have a season of 12/2 to 5/15 for over-snow motorized vehicle travel.

Hunting season access routes 335-A1 and A2 would be closed year-long to wheeled motorized vehicles.

CDNST roads 1802-B2 and 335-B2 would be closed to wheeled motorized vehicles year-long.

There would also be winter closures in lower elevation west facing slopes from Clarks Canyon north to Threemile Creek. Those areas that would remain open have a season of 12/2 to 5/15 for over snow travel.

Microwave Tower area would be closed year-long to wheeled motorized vehicles.

Area 3 Limburger Spring/Kading – This area would be closed year-long to wheeled motorized vehicles.

Negro Mtn. – 1857 –D2, and 1859 D4, and E1 would be closed year-long .

Ontario Creek – The connection from 491-D1 and 4104-A1 would be closed year-long to wheeled vehicles.

Route 314-J3 (Area 3) would be closed year-long to wheeled motorized vehicles but open to over-snow motorized vehicle use.

Area 4 - Hunting season access route 1856 would be closed year-long to wheeled motorized vehicles.

The area south of MacDonald Pass to approximately the Hahn Creek Road would be closed to wheeled and motorized over snow vehicle travel. There would also be winter closures in the Hahn Creek area. Those areas that remain open have a season of 12/2 to 5/15 for over snow travel.

Unauthorized Roads

In this alternative, as in Alternatives 2 and 3, approximately 10 of the 16 miles of non-system routes would be incorporated into the existing system of Forest Roads. Refer to Table 2-Summary Comparison of Roads and Motorized Trails for general information and to Table 4-Roads Under Consideration For Inclusion In The NFS Roads System by Alternative for specific information.

Irreversible and Irretrievable Commitments

There are no irreversible or irretrievable commitments as a result of implementing this alternative.

Cumulative Effects

The cumulative effects of this alternative are projected to be the same as Alternative 2.

Conclusions

Based on the evaluation process identified earlier in this report the following conclusions can be reached:

Transportation System

The implementation of Alternative 2, 3 or 4 would substantially change the existing use of the transportation system. Roads currently closed year long in areas that are open to over snow motorized vehicle use would now be open.

The ability to conduct maintenance would not change with the implementation of any of the alternatives because the limited dollars that are received would continue to be utilized on the highest use roads which are typically the maintenance level 3, 4 or 5 roads. There are no

changes identified in the management of maintenance level 3, 4 or 5 roads so no change in maintenance is anticipated.

Implementation of Alternatives 2, 3 or 4 would clarify the management of roads that are right now classified as "undetermined". There would be a clear understanding of how these user-created routes fit into the existing transportation system by both the organization and by the public.

Road Conditions

Implementation of any of the alternatives would not result in substantial changes to the road conditions. In Alternatives 2, 3 or 4 the biggest change in use of the system by the public would be the increase in over-snow motorized vehicle activity on roads that are currently closed year round. There would be no change to the road surfaces as a result of over-snow motorized vehicle use. In all alternatives, maintenance dollars would continue to be utilized on higher use roads (Typically maintenance level 3, 4 or 5 roads).

Enforcement

Under Alternative 1, the potential for confusion by users is high for the following reasons: seasonal closures are not consistent across the forest (in some cases there is as little as one or 2 day variance in the dates that roads are open), there are areas of the forest that allow over-snow motorized vehicle use in the area adjacent to the road but the roads themselves are closed, and undetermined, user created roads exist on the landscape but are not clearly identified regarding their ties to the transportation system

Implementation of Alternatives 2, 3 or 4 would have the following impacts: the number of ATM codes in use would be consolidated and or changed in an attempt to improve understanding of the forest maps, some roads that are currently closed year long but are located in areas open to over-snow motorized vehicle use would now be open for over-snow motorized vehicle use, and undetermined roads would be clearly identified as necessary to the transportation system or not necessary clarifying their need and purpose to both management and the public.

Forest Plan Consistency

All alternatives would be consistent with the Forest Plan in that: none would involve road construction or reconstruction, maintenance would continue as part of all alternatives and input would be provided by Forest Resource specialists, transportation planning and road management would be coordinated with State and local agencies and owners of intermingled land, the Helena National Forest would generally be open to vehicles except for roads, trails, or areas which may be restricted, travel restrictions would be evaluated annually, enforcement of the Road Management Program would be a high priority, road maintenance would occur based on resource protection, road investment protection, user safety, user comfort, and travel efficiency, and maintenance levels would be constantly monitored for appropriateness and schedules would be prepared annually.

HERITAGE

Regulatory Framework

The National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations in 36 CFR 800, provide the legal framework for considering cultural resources in

project planning. NHPA Section 106 requires that federal agencies take into account, in consultation with the State Historic Preservation Officer (SHPO), Tribes, and the Advisory Council on Historic Preservation (ACHP), the potential effects of agency actions on places and sites of archaeological or historical significance. The act establishes the National Register of Historic Places, a listing of locally, regionally and nationally significant heritage properties (36 CFR 60). In project planning, agency historic preservation specialists use the National Register eligibility criteria to determine the scientific, historical or cultural value of cultural resources affected by projects.

The Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), and Executive Order 13007 (Indian Sacred Sites) also require federal agencies to identify, monitor, protect, and preserve cultural resources under their jurisdictions.

Assumptions

It is assumed that GIS maps showing known cultural resource distributions and existing inventory (field survey) data, provide an adequate means of assessing the general effects of the four travel plan alternatives on cultural resources (see Methodology section).

The 2001 State OHV plan describes a range of OHV impacts to cultural resources on public lands across Montana. These data are largely anecdotal rather than quantitative, and no attempt was made to compare OHV damage to cultural resources with other recreational and non-recreational activities, such as horseback riding, livestock grazing or minerals exploration. Still, it is apparent from these data that cultural resources common to the Helena NF are similarly exposed and vulnerable to OHV travel. Specifically, vehicles cause compaction, rutting, erosion and other disturbances atop cultural resources. They access otherwise remote areas, leaving archaeological and historic ruins exposed to the effects of uncontrolled riding, vandalism, artifact-collecting and theft. Therefore, this analysis assumes that motorized recreation has the potential to cause similar impacts to cultural resources on the Helena NF. It also assumed that non-motorized recreation (i.e. hiking, biking, and skiing) has similar but lesser capacity to cause damage to cultural resources.

Mitigation measures may need to be implemented to avoid causing harm to the roadbed itself or its associated cultural resources.

Information Used

This analysis for the Divide travel planning relied on cultural resource inventory data and site records on file at the Helena National Forest (HNF) Supervisor's Office. These data were generated through project and reconnaissance-level field inventories completed from 1979 to 2010. Cultural resource site and inventory records are contained in Infra, GIS and hard copy records at the HNF Supervisor's Office.

Background context for the planning area are available in various archaeological and historical documents pertinent to the Helena Valley areas (i.e. Beck 1989; Knight 1989).

Methodology & Scientific Accuracy (40 CFR 1502.15)

This analysis focused on cultural resources identified within the Divide travel planning area in the Continental Divide Range of southwestern Montana.

Using GIS data layers, the currently known distribution of cultural resources, as identified during previous project inventories, was laid atop the road and trail system proposed under each alternative to determine where there were overlaps. Cultural resource size and boundary data are not always precise, particularly in absence of intensive surface investigation and mapping (historic sites) or subsurface testing (archaeological sites). For this reason, GIS analysis identified all sites within 600 feet of the roads and trails in each alternative.

Approximately 75% of the identified cultural resources in the planning area are either bisected by or lie within 100' or less of existing road and trails. These cultural resources could be directly affected by closures, seasonal restrictions, or permanent road use and maintenance.

The remaining cultural resources are located at further distances (100-600') from existing roads or trails. These could be indirectly affected by road and trail use or closure. Specifically, these routes provide access to cultural resources and thus invite vandalism, artifact collecting, arson, and other resource-depreciative behaviors. For example, old access roads to late 19th Century granite quarries in Sweeny Creek have been converted to a network of OHV trails. Because these trails now draw attention to the old quarry ruins, many have suffered various kinds of vandalism and abuse.

The effects of the Divide travel plan on cultural resources were evaluated on this basis:

- cultural resources effected permanently by road and trail closures in each alternative
- cultural resources effected by road and trail operations and maintenance

Closed roads and trails that are eventually proposed for reclamation would require NHPA Section 106 compliance reviews since they may be:

- historic in origin;
- linked to a significant cultural resource; or
- contain an exposed historic or prehistoric archaeological site within the roadbed or prism.

Heritage, Affected Environment

Introduction

Archaeological research, ethnographic data, and tribal oral tradition confirm that American Indian peoples have occupied or used the Divide travel plan area of southwestern Montana for thousands of years. Prior to Euroamerican settlement and during the historic period, Indian groups living in what would become Idaho and western Montana made seasonal trips over Continental Divide at MacDonald, Mullan, Priest and other mountain passes en route to hunt bison, trade, socialize, and raid on the Montana plains. After ca. 1720 A.D., these seasonal journeys were facilitated by horse-drawn travois, which transported supplies, hides and meat. As a result of these treks, Indian trails became equestrian thoroughfares or, quite literally, "roads". The Continental Divide area was also used for hunting, wild plant food collecting, tool stone quarrying, and other cultural activities. Today, the Salish, Kootenai, Blackfeet, Shoshone, and other tribes attach cultural significance to archaeological sites found throughout the travel planning area. Contemporary American Indian religious activity occurs at one mountain pass in the Divide area.

During the early 1800s, fur trappers sought beaver in mountain streams throughout the Divide travel planning area. The mountain range was officially explored by the Stevens Expedition in 1854. The Mullan Road, linking Fort Walla Walla with Fort Benton, was subsequently built in 1859-1860 atop one of the Steven Expedition routes, under the supervision of Lieutenant John Mullan, for whom Mullan Pass in the Divide travel planning area is named. Military use was limited but the wagon road greatly facilitated the non-Indian settlement of both Montana and Washington Territories. The first meeting of the Freemasons of Montana (who may have formed the nucleus of the Vigilantes during the early, violent days of the Montana Gold rush) occurred atop Mullan Pass in 1862. An outdoor lodge (with paths, benches and altars), developed in 1955 under a FS special use permit, is maintained on this spot by the Masons.

The Mullan Road served as an important travel route until the Northern Pacific (NP) Railroad (and Mullan Tunnel) was completed in 1883. The NP railroad spurred development of large hardrock (lode) mines and mills throughout the Continental Divide Range, as exemplified by the Drumlummon Mine in Marysville, and the Lee Mountain and Ontario mines in the Ten Mile and Little Blackfoot drainages, respectively. The Divide travel planning area encompasses four major mining districts (Austin/Blossburg, Elliston, Ophir Creek, and Rimini). The abundant (checkerboard) private lands and extensive network of mining ditches and roads throughout the travel planning area demonstrate the scale of mining activity and development. Most patented (private) mining claims have long since been abandoned. Reclamation has occurred at some of these hardrock mining sites. The reclaimed Charter Oak Mine is now a well-used forest interpretive site.

Logging to support mining, community building, and ore smelting in Anaconda and (later) East Helena followed. An extensive flume and ditch system to transport logs to the Elliston railhead is located in the Little Blackfoot River area. Grassy basins atop the Continental Divide seasonally sustained large sheep and cattle herds, as attested by old photographs and the remains of old camps in aspen groves and “sheepherder” monuments atop high promontories. Granite quarrying in the eastern foothills of the Continental Divide provided durable building materials for fire-prone Helena and other fledgling communities across the newly formed State of Montana (1889). Much of the travel planning area was incorporated into the National Forest system in 1906.The Moose Creek Ranger Station was established in the Ten Mile drainage in 1908 to facilitate timber, range, fire, minerals and recreation management by the Forest Service.

The current road and trail system within the Divide travel planning area owes much of its existence to the early cultural history of this region. Upon its formation, the Forest Service simply preempted existing historic travel routes—parts of which had antecedents in American Indian trails and “buffalo roads”. By this process, a variety of historic cultural resources (i.e., mines, homesteads, line camps, trappers cabins, log flumes) to which these roads were intimately connected also came into federal ownership at the turn of the 20th Century. Road improvements and new road construction, particularly that spurred by an extensive Forest Service timber harvesting program beginning in the 1940s, followed. FS administrative uses, coupled with housing development at the wildlands-urban interface and growing OHV use, have added another tier of both non-system and system roads and trails across the Divide travel planning landscape.

Analysis Area

A total of 181 cultural resources are currently identified within or near roads and trails that are the focus of the Divide travel planning analysis. A mix of prehistoric and historic cultural

resources are identified north of Highway 12. Most of the identified cultural resources south of Highway 12 in the Ten Mile and Little Blackfoot drainages are historic in origin and relate to placer and lode mining. The historical or scientific value of many cultural resources in the analysis area has not been determined. The exceptions are major lode mines such as the Ontario and Charter Oak, which have been the focus of NHPA Section 106 compliance for recent mine reclamation work. For purposes of this NEPA analysis, all identified cultural resources are treated as eligible (significant) for listing in the National Register of Historic Places, in accordance with FSM 2363.22.

Heritage, Environmental Consequences

Effects Common to All Alternatives

Direct and Indirect Effects

The 2001 State OHV Plan benefited cultural resources by confining motorized travel to designated routes, as defined in Alternative 1 (Existing Condition). Alternatives 2, 3 and 4 provide area-specific travel plans that replace, in part, the State OHV Plan.

Road and trail closures benefit cultural resources by preventing easy vehicle access to sensitive cultural resources which helps to abate vandalism and artifact theft. For example, because of relatively easy vehicle access across the Divide planning area, historic mining buildings have been dismantled to obtain antique wood for various decorative uses such as in home remodeling and picture frames. Mining equipment, such as ore carts and old equipment parts, has found new homes as lawn and landscaping ornaments. Valuable artifacts are collected for sale in antique shows and on the Internet.

Roads and trails often bisect prehistoric (American Indian) and historic archaeological sites, exposing artifacts in their tread. As time goes by, these treads get deeper and deeper, leading to by-pass routes and multiple treads. The exposed archaeological remains become highly visible and vulnerable to illegal collection, crushing by vehicles, erosion damage and other processes. Permanent roads and trails closures would eliminate some of these problems.

Conversely, permanent road closures under any alternative may limit access to historic sites that people want to visit. This can be construed as a negative effect. Further, some (primitive) roads retain historical value by virtue of their linkage to specific cultural resource sites. Their permanent closure, and potential obliteration (considered under a separate NEPA decision), may diminish the historical value of some of these cultural resources.

Fall to spring road and trail closures provide limited benefit to cultural resources since public use of National Forest land diminishes during this time period and cultural resources are usually blanketed in snow or are otherwise inaccessible due to poor road conditions. However, once these roads are open from late spring through early fall, cultural resources become vulnerable to artifact collection, vandalism, arson, and other depreciative behavior.

Winter use with snowmobiles has limited effects on cultural resources because most cultural resources are obscured by deep snow. Standing historic ruins (i.e., old cabins) are vulnerable to public activity, including use as winter shelter and a ready source of dry firewood. However, there is no strong correlation between snowmobile activity and the dismantling of historic ruins for winter firewood on the Helena NF.

A variety of cultural resources are located within or near major roads and trails that would remain open and available for public use under any alternative. Annual road maintenance continues to degrade some cultural resources exposed in the roadbed and berm. For example, road grading and drainage clearing incrementally pick away at archaeological sites (i.e., Hope Creek) and standing historic ruins. Regardless of alternative, public use will continue on these travel routes and may increase due to road and trail closures elsewhere in the Continental Divide Range and on adjacent public lands managed by the Forest Service and Bureau of Land Management. This situation could potentially accelerate on-going impacts from road maintenance and use.

Road closures will eventually necessitate evaluation and implementation of closure methods, which could include road obliteration, ripping and seeding. Contingent on the targeted roads and OHV trails, this could have an adverse effect on cultural resources. The effect of this activity could be mitigated by using various closure methods in areas where cultural resources are currently exposed in road and trail bed. For example, road segments within identified archaeological sites could be buried with soil, as opposed to being ripped and seeded. As an outcome of road and trail closures, any future obliteration will require careful long-range planning to insure that cultural resource inventory, evaluation and treatment precede such undertakings (ground-disturbance), in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended.

Effects Common to All Action Alternatives

Irreversible/Irretrievable Commitments

Travel management may increase public access, and as a consequence, enhance opportunities for artifact collecting and vandalism. Travel management may inadvertently expose previously undiscovered prehistoric or historic sites. It is possible that exposed artifacts and/or ruins would be observed and not reports to the Forest Service, thus providing opportunities for artifact collecting and vandalism. However, the results of past cultural resources monitoring and inventories suggest that these kinds of indirect effects would be negligible.

Cumulative Effects

All action alternatives would improve cultural resource protection in the Divide travel planning area in the short- and long-term. See Alternative 1 for a description of Past, Present and Reasonably Foreseeable Future Actions.

Alternative 1, No Action

Alternative 1 falls under the purview of the 2001 State OHV Plan and eliminates cross-country travel. It provides the same level of protection to the culture resource base within the travel planning area as currently exists. Some 85 miles of roads and trails are closed under this alternative, the bulk of which are snowmobile routes which are open under Alternative 2.

Cultural resources would remain vulnerable to vandalism and related impacts because OHV riding would be allowed yearlong on a wide range of designated routes.

The numerous open roads and trails provide ample access to cultural resources for purposes of monitoring, scientific investigation and potentially interpretation, which is a beneficial effect.

Road maintenance will continue to degrade some cultural resources in the travel planning area under Alternative 1.

Indirect Effects

The Existing Condition protects many vulnerable cultural resources by confining motorized travel to designated routes. It would preclude the opportunity to further protect cultural resources that may currently be vulnerable to vehicle traffic, artifact collecting and natural deterioration in undesignated routes.

Irreversible/Irretrievable Commitments

Since no actions associated with this project would occur, there would not be a need to inventory the planning area. Therefore, additional cultural resources data would not be realized.

Cumulative Effects

This alternative is the existing condition and does not improve cultural resource protection in the Divide travel planning area.

Past Actions – The Continental Divide Range, and its adjacent foothills and valley bottoms, has supported livestock grazing, logging, recreation and utility development during the last 140 years. These activities and particularly the road construction associated with them, have exposed, and in some cases damaged, cultural resources. However, it is difficult to quantify the effects of these past actions on cultural resources in the Divide travel planning area.

Since the late 1970s, cultural resource inventories have preceded all ground-disturbing Forest Service projects in the Divide travel planning area including vegetation treatments, livestock grazing, restoration, and recreation development. The majority of the cultural resources described in this travel plan analysis were discovered as a result of these compliance inventories. In fact, many archaeological sites were found because they were exposed in old road and trail beds. In most cases, project boundaries and treatments were reconfigured to avoid impacting important cultural resources so the cumulative effect of these actions on cultural resources has been relatively minor.

Present Actions – Cultural resource inventory and evaluation has preceded restoration work—fencing, weed treatment, road and trail repairs, reforestation and stock watering repairs. On-going forest activities will continue to have a cumulative effect on cultural resources. Livestock grazing, in particular, continues to degrade prehistoric and historic resources, especially where they concentrate near water sources. Roads and trails have been constructed through archaeological and historic sites over a period of many years. Regardless of alternative, road maintenance, especially road grading, and road use will continue to degrade cultural resources, particularly prehistoric archaeological sites. Cultural resources exposed in roadbeds and borrow pits invite illegal artifact collecting.

Reasonably Foreseeable Future Actions – Future actions in the analysis area focus on public safety and environmental health and include fire and watershed restoration, hazardous fuels reduction, abandoned mine reclamation, and minor recreation developments, and mineral operations (see list in DEIS). In all likelihood, the effects of these projects on cultural resources can be mitigated through project re-design and avoidance.

Despite economic uncertainty and other factors, Lewis and Clark and Jefferson Counties will continue to be developed at an incremental pace. The cumulative effect of this demographic growth (i.e., rural subdivisions, commercial development) at the forest-urban interface on HNF cultural resources is difficult to estimate but easier access (i.e., trails out of subdivisions) into Continental Divide Range (i.e., Sweeny Creek area) may increase the problems described above, such as user-built trail proliferation atop cultural resources, artifact collecting and vandalism.

Alternative 2

Direct Effects

Alternative 2 would close additional miles of non-system and system roads and trails to wheeled vehicles that pass closely or directly through 53 identified cultural resources. This alternative will leave 112 miles of road open to over snow vehicles. Permanent closures would protect these cultural resources from on-going damage by continued wheeled vehicle traffic and public use, and be a beneficial effect.

At the same time, permanent closures would constrain public access for purposes of agency or agency-authorized scientific investigation, monitoring and protection-related activities.

Road maintenance would continue to degrade cultural resources in the Divide travel planning area.

Indirect Effects

Alternative 2 would improve cultural resource protection over Alternative 1 by decreasing road access across the Divide travel planning area. This, in turn, would reduce cultural resource exposure to artifact collecting, vandalism and other depreciative behavior.

Alternative 3

Direct Effects

Alternative 3 would close additional miles of non-system and system roads and trails yearlong to wheeled motorized vehicles that pass closely or directly through 77 identified cultural resources. These various closures would benefit cultural resources by limiting public access. However, this alternative will leave 156 miles of road open to over snow vehicles. The negative effect would be constraining Forest Service administrative and public recreational access to these historic ruins and features.

Road maintenance would continue to degrade cultural resources in the Divide travel planning area.

Indirect Effects

Alternative 3 would improve cultural resource protection over Alternatives 1 and 2 by decreasing road access across the Divide travel planning area. This, in turn, would reduce cultural resource exposure to artifact collecting, vandalism and other depreciative behavior.

Alternative 4

Direct Effects

Alternative 4 would close additional miles of non-system and system roads and trails yearlong to wheeled motorized vehicles that pass closely or directly through 65 identified cultural resources. These various closures would benefit cultural resources by limiting public access. However, this alternative will leave 139 miles of road open to over snow vehicles. The negative effect would be constraining Forest Service administrative and public recreational access to these historic ruins and features.

Roads and trails in Sweeny Creek would be closed year-long to motorized vehicles, which would benefit cultural resources.

Road maintenance would continue to degrade cultural resources in the Divide travel planning area.

Indirect Effects

Alternative 4 would improve cultural resource protection over Alternatives 1 by decreasing road access across the Divide travel planning area. This, in turn, would reduce cultural resource exposure to artifact collecting, vandalism and other depreciative behavior.

Conclusions

The Divide travel planning area contains a variety of cultural resources. Overall, travel planning would have a beneficial effect on cultural resources. Alternative 1 essentially implements the State OHV Plan by eliminating cross-country travel and confining motorized travel, including snowmobiles in some areas, to designated routes. It does not increase protection of cultural resources by closing numerous open roads and trails but it does provide ample access to cultural resources for purposes of monitoring, scientific investigation and potentially interpretation.

Alternative 2 would permanently close approximately 6 miles of non-system roads and trails, which would benefit cultural resources over Alternative 1. These closures might constrain some administrative and public access to cultural resources, but overall there is ample opportunity for the public to visit cultural resources in the Divide travel planning area.

Alternative 3 would permanently close approximately 7 miles of system and non-system roads and trails, which would benefit cultural resources over both Alternatives 1 and 2.

Alternative 4 would permanently close approximately 6 miles of system and non-system roads and trails, which would benefit cultural resources over Alternatives 1, 2 and 3.

Permanent road and trail closures that eventually lead to obliteration (ripping, seeding), as based on future site-specific NEPA and NHPA analyses, could adversely affect identified cultural resources unless mitigation treatments are imposed (e.g., bury the road bed with topsoil as opposed to ripping up the tread, and the archaeological deposit). Road closure methods are not part of the current Divide travel plan decision, but they are linked.

Compliance inventory, evaluation of site significance and project effect, consultation with the Montana State Historic Preservation Office and Tribal Historic Preservation Officers, and implementation of design features for project-affected cultural resources would comply with

the National Historic Preservation Act and its implementing regulations in 36 CFR 800, as well as Helena National Forest Plan (USDA 1986) standards and guidelines.

Forest Plan Consistency

The Forest Plan requires the integration of cultural resources in project planning and forest management. Compliance inventory, evaluation of site significance and project effect, consultation with the Montana State Historic Preservation Office and Tribal Historic Preservation Officers, and implementation of design features for project-affected cultural resources would comply with the National Historic Preservation Act and its implementing regulations in 36 CFR 800, as well as Helena National Forest Plan (USDA 1986) standards and guidelines.

SOILS

Regulatory Framework

National Forest Roads and Trails Act of 1964 (78 Stat. 1089; 16 U.S.C. 532-538)

Section 1 of the National Forest Roads and Trails Act states "Congress hereby finds and declares that the construction and maintenance of an adequate system of roads and trails within and near the national forests and other lands administered by the Forest Service is essential". This system of roads is needed "to provide for intensive use, protection, development, and management of these lands under principles of multiple use and sustained yield of products and services". (16 U.S.C. 532)

Section 2 of this act states, "The Secretary is authorized, under such regulations as he may prescribe, subject to provisions of this Act, to grant permanent or temporary easements for specified periods or otherwise for road rights-of-way (1) over national forest lands administered by the Forest Service". (16 U.S.C. 533)

Implicit in this legal direction is Forest Service authority to withdraw lands from vegetation production and related soil productivity on National Forest for dedication to road and trail corridors for transportation and access uses.

National Environmental Policy Act of 1969

This report was developed using the principle elements from the NEPA of 1969 and the regulations for implementing the procedural provisions of the NEPA from the Council on Environmental Quality (40 CFR Parts 1500-1508) and Regulation 36 CFR Part 220.

National Forest Management Act of 1976 (90 Stat. 2949; 16 U.S.C. 1608)

Section 8(b) of the National Forest Management Act states, "any road constructed on land of the National Forest system in connection with a timber contract or other lease shall be designed with the goal of reestablishing vegetation cover on the roadway and areas where vegetation cover has been disturbed by the construction of the road, within ten years after the termination of the contract, permit, or lease". This section of the Act further states, "Such action shall be taken unless it is determined that the road is needed for use as a part of the National Forest Transportation System".

This legal direction states that lands no longer needed for, and dedicated to, transportation or access uses should be returned to a vegetated state. Implicit in this legal direction is Forest

Service responsibility to recover soil productivity on these lands, to the extent that vegetation can be re-established. Type and degree of soil recovery necessary for re-establishment of vegetation will depend on site-specific conditions and land management objectives for that area.

Section 8(c) of this act states "Roads constructed on National Forest System lands shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land resources".

Helena National Forest Plan of 1986

The Helena National Forest Plan provides further guidance: "Areas of decomposed granite soils will be identified and erosion control measures planned prior to ground disturbing activities"; "To reduce sedimentation associated with management activities, the highly sensitive granitic soils, which cover about 20 percent of the Forest, will have first priority for erosion control" (USDA Forest Service 1986, page II-26).

The National Forest Roads and Trails Act of 1964 authorize the Forest Service to establish and maintain a network of roads and trails on National Forest System Lands. Implicit in this legal direction is Forest Service authority to withdraw lands from vegetation production and related soil productivity on National Forest for dedication to road and trail corridors for transportation and access uses. Thus, Helena National Forest Plan guidance to sustain soil productivity when planning management activities (page II/26) would not be applicable to this decision to open or close travel routes, because the National Forest Roads and Trails Act (1964) authorizes the Forest Service to withdraw lands from vegetation production and related soil productivity for dedication to use as road and trail corridors.

Additionally, this environmental effects analysis for soil resources will not evaluate compliance with Region 1 soil quality standards. Rather, this analysis for soil resources provides background information for better understanding watershed impacts from roads and trails within the Divide travel planning area.

Assumptions

Roads located on private land and those that are not under Forest Service management were not considered in this analysis.

No ground disturbing activities are proposed in this project.

Use of over-snow vehicles would not result in any soil disturbance as the ground would be covered with snow.

Soil impacts would be greater on roads than compared to non-motorized and motorized trails 50" in width or less. This is because cut and fill associated with roads frequently results in a larger area of soil disturbance than that of trails.

Other than roads and trails over sensitive soils (typically riparian areas), areas most prone to extensive soil degradation would include routes that run parallel to the slope and complex networks or "spaghetti" road patterns.

Information Used

Information used consists of professional interpretations of landtypes based upon the "Soil Survey of Helena National Forest Area, Montana" USDA Forest Service and Natural Resource Conservation Service 2001 and queries from excel database files.

Helena NF Roads Analysis: 2002-2004

Methodology and Scientific Accuracy

The data used for the analysis of this report is the best available data with regards to accuracy of route location, soil type and associated soil properties. The road and trail layer was overlaid with the soil landtypes designated as "sensitive" for a GIS product displaying the miles of roads and trails occurring on specific designated sensitive landtypes. Sensitive landtypes were grouped into four categories of geologic hazard as identified in the Soil Survey of the Helena National Forest, 2001. These hazards address soils that occur in positions identified as; Landslide/Slump prone, Wet/Flood prone areas, Granitic soils and soils with Volcanic Ash surfaces. From this information, all routes were stratified based on these geologic hazards and then further divided by Open or Closed travel restriction.

For the Soil Resource analysis report, all routes from each geologic hazard were grouped into open or closed travel restriction. For those travel restrictions that allow any wheeled motorized travel at any time of year, they were placed into the Open category. The closed category was applied to those routes that are closed to all wheeled motorized travel yearlong. Travel restriction codes in the Open category include: 02, 03, 05, 07, 13, 15, Open Hwy Legal, U Open Hwy Legal, M-07, MT, MT 5/16 – 10/14 and M-08.1. Travel restriction codes in the Closed category include: 01, 06, 06-SPC, NS-01-RES, MT-01, NS-01-RES and NONMT. This assumption is based on the premises that as long as routes are open to wheeled motorized use, for any length of time, the potential to perform decommissioning would not be possible.

Soils, Affected Environment

Introduction

The planning area is the southern portion Continental Divide area, known as the Divide travel planning area, located west of Helena Montana on the Helena District of the Helena National Forest.

Analysis Area

Within the Divide travel planning area, there are 60 landtypes affected by roads and trails; 12A, 12B, 12C, 12D, 13A, 14, 14A, 14B, 14C, 15, 21, 26, 31, 32, 32A, 32B, 36, 36A, 36B, 39, 39A, 41, 44, 46, 47, 47B, 49, 49A, 49B, 56, 56A, 57A, 59, 59A, 76, 76A, 77, 77A, 77B, 79, 79B, 80, 86, 87, 90, 100, 101, 110, 120, 130, 136, 150, 210, 260, 320, 360, 390, 470, 490, 790.

Soil effects from roads and trails include: removal of vegetative cover, compaction, degradation of soil structure, decreased infiltration and water holding capacity, reduction in organic material, accelerated surface erosion, and exacerbation of mass failure, such as landslides or slumps. These types of soil impacts can occur on the prism of all roads and trails, whether those routes are used for motorized or non-motorized access.

Sensitive soils are selected as indicators because they represent landscapes most vulnerable to watershed impacts from roads or trails. Detrimental watershed impacts would include:

- Soil compaction with increased surface water runoff and accelerated erosion
- Routing of sediment and surface water runoff from road or trail prisms to streams
- Direct connection between roads or trails and streams at crossings, including culverts, fill material, etc

Sensitive soils are based on 44 landtypes that are prone to landslides, slumps, flooding, and soils that are vulnerable to compaction and erosion as a result of moisture content, parent material, and slope. This project addresses 37 of the 44 landtypes. These determinations are based upon the "Soil Survey of Helena National Forest Area, Montana" USDA Forest Service and Natural Resource Conservation Service 2001. Table 3.14 displays the sensitive landtypes on the Helena National Forest.

Table 3.14 Sensitive soil landtypes broken out by geological hazard.

Soil Geologic Hazards (from HNF SRI)	"Sensitive" Landtypes
Landslide Map Units: Landslide-prone and wet soils	15, 15C, 150
Colluvial Map Units: Slump-prone and wet soils	14, 14A, 14B, 14C
Wet Soil Map Units	12A, 12B, 12C, 12D, 13A, 14, 14A, 14B, 14C, 15, 15C, 36B, 100, 101, 130, 136, 150
Loess w/ Volcanic Ash Map Units: Vulnerable to compaction & Highly erodible soils	12B, 12C, 49B, 56, 57, 57A, 58, 59, 59A, 59B, 76, 76A, 77, 77B, 79, 89, 90, 790, 791
Granitic Map Units: Highly erodible soils	12C, 26, 36, 36A, 36B, 46, 56, 56A, 76, 76A, 86, 89, 120, 260, 360
Flood Plains & Terrace Map Units: Flood-prone areas and wet soils	100, 101
Alluvial Fan MU: Flood-prone areas	110

The following 38 landtypes are designated as sensitive soils within the Divide planning area: 12A, 12B, 12C, 12D, 13A, 14, 14A, 14B, 14C, 15, 26, 36, 36A, 36B, 46, 49B, 56, 56A, 57A, 59, 59A, 76, 76A, 77, 77B, 79, 86, 90, 100, 101, 110, 120, 130, 136, 150, 260, 360, and 790.

Landslide and Slump Prone Landtypes

Soils prone to landslide and slumping are typically derived from loose or incoherent material. The landslide and slump-prone landtypes in this planning area include landtypes 14, 14A, 14B and 14C 15 and 150.

Wet soil and Flood Prone Landtypes

Wet soils and flood prone landtypes typically occur on areas with surface water (either seasonal or yearlong), poor drainage, or riparian areas near streams, springs or seeps. These sites are usually found in geographical depressions, concave shaped areas or along fault zones. The wet soil and flood prone landtypes in this planning area include landtypes 12A, 12B, 12C, 12D, 13A, 14, 14A, 14B, 14C, 15, 36B, 100, 101, 110, 130, 136 and 150.

Loess with Volcanic Ash Landtypes

These soil's textures range from silt to sand sized particles that have been deposited by wind events. Loess and ash derived soils are vulnerable to compaction and susceptible to erosion when not vegetated. Loess with volcanic ash lantypes in this planning area include landtypes 12B, 12C, 49B, 56, 57A, 59, 59A, 76, 76A, 77, 77B, 79, 90 and 790.

Granitic Landtypes

Granitic parent materials weather relatively quickly into coarse textured soils which are also susceptible to erosion when not vegetated. Grantitic landtypes in the planning area include landtypes 12C, 26, 36, 36A, 36B, 46, 56, 56A, 76, 76A, 86, 120, 260 and 360.

Soils, Environmental Consequences

Effects Common to All Alternatives

Although no road decommissioning is proposed in the scope of this project, this action sets up the potential for roads on sensitive soils to be reclaimed in future projects. Simply removing the road bed from motorized use would encourage revegetation which would in turn begin to allow the road bed to act more as a natural site, however, soil impacts such as compaction and decreased infiltration capacity on road or trail prisms can persist for several decades even though transportation or access use is discouraged. Physical features, such as compaction, would not be mitigated until mechanical treatments can be applied.

Impact on Soils from Off-route Activity

Transportation uses can indirectly impact soil productivity on lands outside the road or trail prism when travelers establish new routes, especially to avoid trail obstructions and crossing difficult terrain or wet areas. Soil impacts associated with non-system routes can occur on all types of roads and trails, whether those routes are used for motorized or non-motorized access. This activity results in soil quality degradation on areas that are identified for other types of uses in the Forest Plan, such as timber or forage production, and provision for wildlife or fisheries habitat. A portion of these routes have been identified as U Open Hwy Legal (under Alternative 1) and NS-01-RES (under Alternative 2, 3, and 4) in the Divide travel planning corridor.

Impact on Soils from Roads and Trails

Generally, roads and trails are a dedicated use for lands that comprise the road prism. Impacts to soil productivity resulting directly from the presence of roads and trails are not evaluated for compliance with Region 1 soil quality standards, because the affected land is managed for transportation uses not for vegetation production.

Effects Common to All Action Alternatives

Alternative 2, Alternative 3 and Alternative 4 would consist of closing approximately 5.8 miles of unauthorized routes (user created), which would in turn be considered a benefit to soils. These routes are assumed to be the most detrimental to soil conditions because they were not constructed with any erosion prevention measures.

Alternative 1, No Action

Direct and Indirect Effects

Below is a description of the miles of road on each identified sensitive landtype feature. The quantities described do not take into account state highways, county roads or routes on private land occurring on sensitive landtypes.

Table 3.15 Alternative 1, Miles of Open and Closed Roads on Sensitive Landtypes

Sensitive LT feature	Miles of open roads	Miles of closed roads
Landslide/Slump prone	19.29	9.49
Wet/Flood prone	37.38	18.44
Granitic	66.07	33.39
Volcanic Ash	55.82	28.43
Total miles	178.56	89.75

Irreversible and Irretrievable Commitments

No ground disturbing activity is proposed as part of this scope or decision, therefore no soil related irreversible and/or irretrievable commitments exist.

Cumulative Effects

There are approximately 5.8 miles of unauthorized roads or trails (user created) occurring on all four sensitive landtypes. These routes are assumed to be the most detrimental to soil conditions because they were not constructed with any erosion prevention measures. Therefore, no action would leave these routes open to use and would potentially further degrade soil conditions.

Essentially no action taken would only perpetuate further degradation of areas which contain sensitive soils, however small. Degradation may include compaction and increased runoff from non vegetated areas which would transport sediment off the native site.

Alternative 2

Direct and Indirect Effects

Below is a description of the miles of road on each identified sensitive landtype feature. The quantities described do not take into account state highways, county roads or routes on private land occurring on sensitive landtypes.

Table 3.16 Alternative 2, Miles of Open and Closed Roads on Sensitive Landtypes

Sensitive Landtype Feature	Miles of open roads	Miles of closed roads
Landslide/Slump prone	20.21	8.59
Wet/Flood prone	36.68	19.15

Sensitive Landtype Feature	Miles of open roads	Miles of closed roads
Granitic	66.21	33.25
Volcanic Ash	56.38	27.89
Total miles	179.48	88.88

When comparing Alternative 2 to Alternative 1, the miles of routes opened for wheeled motorized use increase for routes occurring on Landslide/Slump prone areas, Granitic soils and those soils occurring on Volcanic Ash dominated soils by approximately 1 mile. The routes occurring on Wet/Flood prone areas decrease by roughly .7 of a mile.

Alternative 2 would result in a net increase in the number of miles of routes open to wheeled motorized use on sensitive soils.

Irreversible and Irretrievable Commitments

No ground disturbing activity is proposed as part of this scope or decision, therefore no soil related irreversible and/or irretrievable commitments exist.

Cumulative Effects

Since no ground disturbing activities are proposed as part of Alternative 2, there is no potential for cumulative effects from the soil resource when analyzing past, present and reasonably foreseeable actions.

Excluding some forms of wheeled motorized use such as full-sized vehicles would decrease exposed soil surfaces by removing a portion of the road from regular travel. Once vegetation begins to establish on the unused surfaces, runoff and sediment transport will decrease. Compaction will still be a factor in areas of use.

Alternative 3

Direct and Indirect Effects

Below is a description of the miles of road on each identified sensitive landtype feature. The quantities described do not take into account state highways, county roads or routes on private land occurring on sensitive landtypes.

Table 3.17 Alternative 3, Miles of Open and Closed Roads on Sensitive Landtypes

Sensitive Landtype Feature	Miles of Open Roads	Miles of Closed Roads
Landslide/Slump prone	14.91	13.87
Wet/Flood prone	32.62	23.21
Granitic	49.57	49.88
Volcanic Ash	46.38	37.89
Total miles	143.48	124.85

When comparing Alternative 3 to Alternative 1, the miles of routes opened for wheeled motorized use decreases by approximately 35 miles for Landslide/Slump prone areas, Wet/Flood prone areas, routes on Granitic soils and for routes occurring on Volcanic Ash soils overall.

The effects of Alternative 3 include a net reduction in the number of miles of routes open to wheeled motorized use on sensitive soils

Irreversible and Irretrievable Commitments

No ground disturbing activity is proposed as part of this scope or decision, therefore no soil related irreversible and/or irretrievable commitments exist.

Cumulative Effects

Since no ground disturbing activities are proposed as part of Alternative 2, there is no potential for cumulative effects from the soil resource when analyzing past, present and reasonably foreseeable actions.

Excluding some forms of wheeled motorized use such as full-sized vehicles would decrease exposed soil surfaces by removing a portion of the road from regular travel. Once vegetation begins to establish on the unused surfaces, runoff and sediment transport will decrease. Compaction will still be a factor in areas of use.

Alternative 4

Direct and Indirect Effects

Below is a description of the miles of road on each identified sensitive landtype feature. The quantities described do not take into account state highways, county roads or routes on private land occurring on sensitive landtypes.

Table 3.18 Alternative 4, Miles of Open and Closed Roads on Sensitive Landtypes

Sensitive Landtype Feature	Miles of Open Roads	Miles of Closed Roads
Landslide/Slump prone	16.83	12.44
Wet/Flood prone	32.99	22.83
Granitic	51.06	48.40
Volcanic Ash	50.63	33.64
Total miles	151.01	117.31

When comparing to Alternative 4 to Alternative 1, the miles of routes opened for wheeled motorized use decreases by approximately 28 miles for Landslide/Slump prone areas, Wet/Flood prone areas, routes on Granitic soils and for routes occurring on Volcanic Ash soils overall.

The effects of Alternative 4 include a net reduction in the number of miles of routes open to wheeled motorized use on sensitive soils

Irreversible and Irretrievable Commitments

No ground disturbing activity is proposed as part of this scope or decision, therefore no soil related irreversible and/or irretrievable commitments exist.

Cumulative Effects

Since no ground disturbing activities are proposed as part of Alternative 2, there is no potential for cumulative effects from the soil resource when analyzing past, present and reasonably foreseeable actions.

Excluding some forms of wheeled motorized use such as full-sized vehicles would decrease exposed soil surfaces by removing a portion of the road from regular travel. Once vegetation begins to establish on the unused surfaces, runoff and sediment transport will decrease. Compaction will still be a factor in areas of use.

Conclusions

Combining Landslide/Slump prone, Wet/Flood prone, Granitic and Volcanic Ash soils, there are currently about 268 total miles of routes open to wheeled motorized use on sensitive soils within the Divide planning area. Implementing Alternative 2 there would cause a negligible net increase of approximately one mile of road accessible to wheeled motorized use on sensitive soils. Alternative 3 would result in an approximate reduction of 35 miles of routes open to wheeled motorized use on sensitive soils. Alternative 4 would result in an approximate reduction of 18 miles of routes open to wheeled motorized use on sensitive soils.

Soil effects from roads and trails include: removal of vegetative cover, compaction, degradation of soil structure, decreased infiltration and water holding capacity, reduction in organic material, accelerated surface erosion, and exacerbation of mass failure, such as landslides or slumps. These types of soil impacts can occur on the prism of all roads and trails, whether those routes are used for motorized or non-motorized access.

Although no travel route decommissioning is proposed in the scope of this project, this action sets up the potential for travel routes on sensitive soils to be reclaimed in future projects. Administrative changes such as installation of a sign or barrier at the entrance to the route, changing the maintenance level or type of use without making any physical improvements to the road or trail prism would be evaluated as having low effectiveness for improving watershed conditions. These methods would not be considered effective in reclaiming soil productivity. Soil impacts such as compaction and decreased infiltration capacity on road or trail prisms can persist for several decades without implementation of physical reclamation measures, even though transportation or access use is discontinued. Physical features, such as compaction, will not be mitigated until mechanical treatments can be applied

Forest Plan Consistency

Alternative 1

The Forest soil standards do not apply to this project because there are no ground disturbing activities proposed.

Alternative 2

Alternative 2 would not move in the direction outlined in the Helena National Forest's Plan when managing for preservation of Granitic soils. The criteria are described on page II/26 section 3 under Soil Guidance. Which states:

(Section 3) "To reduce sedimentation associated with management activities, the highly sensitive granitic soils, which cover about 20 percent of the Forest, will have first priority for soil erosion control. "

Alternative 2 would result in an increase of routes open to wheeled motorized use occurring on Granitic soils. Although, completely eliminating routes on all Granitic landtypes would be most beneficial, it would be simply impractical to effectively manage the Forest. Designated Forest routes are designed to minimize erosion and sediment potential.

The Forest soil standards do not apply to this project because there are no ground disturbing activities proposed.

Alternative 3

Alternative 3 is moving in the direction as outlined in the Helena National Forest's Plan when managing for preservation of Granitic soils. The criteria is described in the Forest Plan on page II/26 section 3 under Soil Guidance, and as described above.

Alternative 3 would result in a reduction of routes open to wheeled motorized use occurring on Granitic soils. Although, completely eliminating routes on all Granitic landtypes would be most beneficial, would be simply impractical to effectively manage the Forest. Designated Forest routes are designed to minimize erosion and sediment potential.

The Forest soil standards do not apply to this project because there are no ground disturbing activities proposed.

Alternative 4

Alternative 4 is moving in the direction as outlined in the Helena National Forest's Plan when managing for preservation of Granitic soils. The criteria is described in the Forest Plan on page II/26 section 3 under Soil Guidance, and described above.

Alternative 4 would result in a reduction of routes open to wheeled motorized use occurring on Granitic soils. Although, completely eliminating routes on all Granitic landtypes would be most beneficial, would be simply impractical to effectively manage the Forest. Designated Forest routes are designed to minimize erosion and sediment potential.

The Forest soil standards do not apply to this project because there are no ground disturbing activities proposed.

HYDROLOGY

Introduction

The Divide travel planning area includes portions of 22 Sixth Hydrologic Unit Code (6th-HUC) watersheds in the Little Blackfoot River and Lake Helena drainages. This travel plan analyzes motorized travel on routes located within the planning area. It would include signing routes. Any route designated as closed year long to wheeled motorized vehicles may potentially be fully decommissioned in a separate NEPA analysis. From the standpoint of watershed improvement,

the primary value of this travel plan is that it will identify routes which are *available* to be decommissioned through separate, future analysis.

This decision would not include any ground-disturbing activities—all of the affected roads are already on the landscape, and none will be removed as a result of this decision. Therefore, there are no direct effects and no easily quantified indirect or cumulative effects of the decision on water resources. A road closed by this decision may generate less, the same, or more sediment over time as a result of the closure, depending on the road surface condition, the topography of the road and surrounding terrain, the effectiveness of the closure, and other factors. Similarly, a road opened by this decision may or may not become a greater source of sediment, depending on level of use, maintenance, improvements, and other factors. Given this uncertainty, no effort was made to estimate sediment delivery from the road network under each alternative. Instead, in order to estimate the potential impact of the proposed alternatives on water resources in the analysis area, number of road-stream crossings and miles of road within 150 feet of stream in open and closed designation were compared for each alternative, following the assumption that at least some of the closed routes would eventually be decommissioned.

Regulatory Framework

Clean Water Act (CWA)

The Clean Water Act stipulates that states are to adopt water quality standards. Included in these standards are provisions for identifying beneficial uses, establishing the status of beneficial uses, setting water quality criteria, and establishing Best Management Practices (BMP's) to control non-point sources of pollution. Executive Order 12088 also requires the Forest Service to meet the requirements of the Act. Section 313 of the Clean Water Act requires Federal agencies to comply with all Federal State, interstate, and local requirements, administrative authority, and process and sanctions with respect to control and abatement of water pollution. Section 303(d) of the Clean Water Act stipulates that states must identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). For waters identified on this list, states must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

Forest Service Manual sections 2532.02, 2532.03

Sections 2532.02 and 2532.03 of the Manual describe the objectives and policies relevant to protection (and, where needed, improvement) of water quality on National Forest System Lands so that designated beneficial uses are protected. Guidelines for data collection activities (inventory and monitoring) are also described.

Montana Code Annotated (MCA) 75-5-303: Non-Degradation Policy

This policy mandates that "existing uses of state waters and the level of water quality necessary to protect those uses must be maintained and protected," although activities existing as of April 1993 that generate non-point-source pollution are exempted from this policy (MCA 75-5-303[1-2], MCA 75-5-317[2][a]). This exemption would apply to most HNF system roads.

Montana Code Annotated (MCA) 75-5-703: Development and Implementation of TMDLs

In water bodies for which a TMDL has been developed and implemented, Montana law supports a "voluntary program of reasonable land, soil, and water conservation practices for nonpoint

source activities for water bodies" in order to achieve compliance with water quality standards (MCA 75-5-703 [8]). In water bodies identified as impaired and in need of TMDL development, but for which no TMDL has been completed, "new or expanded nonpoint source activities affecting a listed water body may commence and continue if those activities are conducted in accordance with reasonable land, soil, and water conservation practices" (MCA 75-5-703 [10][c]).

Administrative Rules of Montana (ARM) 17.30.6: Surface Water Quality Standards and Procedures

Montana law links water quality to the attainment of "beneficial uses" in a water body. Designated beneficial uses vary by water body classification. The state has classified most of the streams within the planning area as *B-1* (ARM 17.30.610). Water bodies classified as *B-1* must be "maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply" (ARM 17.30.623[1]). There are some additional specific standards that apply to *B-1* waters" (ARM 17.30.623[2]). Upper Tenmile Creek is classified as *A-1* (ARM 17.30.610). Water bodies classified as *A-1* have the same beneficial uses as *B-1* waters, with some additional specific standards (ARM 17.30.622[3]) similar to those listed for *B-1* waters.

The additional standards for *A-1* and *B-1* waters that are pertinent to this project include "no increases are allowed above naturally occurring concentrations of sediment or suspended sediment (except as permitted in 75-5-318 , MCA), …, which will or are likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife" (ARM 17.30.622[3][f]) for both categories, and "no increase above naturally occurring turbidity or suspended sediment is allowed except as permitted in 75-5-318, MCA" for *A-1* waters (ARM 17.30.623[3][d]) and "the maximum allowable increase above naturally occurring turbidity is five nephelometric turbidity units except as permitted in 75-5-318, MCA" for *B-1* waters (ARM 17.30.622[3][d]). The term *naturally occurring* implies "conditions or material present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil and water conservation practices have been applied" (ARM 17.30.602). *Reasonable land, soil, and water conservation practices* consist of "methods, measures, or practices that protect present and reasonably anticipated beneficial uses" (ARM 17.30.602).

National Forest Management Act (NFMA)

Roads constructed on National Forest System (NFS) lands shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources. This is understood to mean that the transportation system on NFS lands provides protection for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperature, blockages of water courses, and deposits of sediment, where roads are likely to seriously and adversely affect water conditions or fish habitat.

National Environmental Policy Act (NEPA)

This report was developed using the principle elements from the NEPA of 1969 and the regulations for implementing the procedural provisions of the NEPA from the Council on Environmental Quality (40 CFR Parts 1500-1508) and Regulation 36 CFR Part 220.

Forest Plan Standards

Forest-wide standards relating to water resources include the following:

Water currently meeting state water quality standards will be maintained by applying soil and water conservation practices. Any project which causes excessive water pollution or undesirable water yield will be corrected where feasible, or the project will be re-evaluated or terminated (II/25).

Practices in the Soil and Water Conservation Practices Handbook (FSH 2509.22) developed cooperatively by the State Water Quality Agency and the Forest Service will be incorporated, where appropriate, into all land use and project plans as a principal mechanism for controlling non-point pollution sources and meeting State water quality standards and other resource goals (II/25).

Assumptions

The Divide travel plan decision will include only open-or-closed determinations—no decommissioning measures will be specified in this decision.

The act of closing a road to all but administrative use without action to stabilize the road (e.g. pulling culverts, decompacting, seeding) may not result in any benefit to the watershed.

Any route designated *as closed year-long to wheeled vehicles* may potentially be fully decommissioned in a separate NEPA analysis and decision

Any existing route not identified as a HNF system route in this travel plan decision would be considered a non-system route and would be available for decommissioning.

Road maintenance and improvements in the Divide travel planning area following this decision will occur at a pace similar to that of the past several years (i.e. there will continue to be a road maintenance backlog for roads within the Divide travel planning area).

Analysis for and decisions on future projects (e.g. Telegraph Salvage) may determine methods of closure (e.g. decommissioning) for closed roads within the Divide travel planning area.

Road maintenance (blading, culvert-clearing) and improvements (surfacing, replacing culverts) may result in temporary increases in sediment delivery to streams, but will result in a long-term (3-5+ year) reduction in sediment delivery from planning area roads.

In streams with no previously identified water-quality impairment, this report will assume that beneficial uses are being fully met, and will continue to be met if the proposed travel plan results in no net increase in sediment delivery from roads.

No measurable change in water yield will occur as a result of this decision, because the decision only describes the open-or-closed status of existing roads (i.e. no tree removal will occur as a result of this decision).

Information Used

Helena National Forest GIS data – Datasets used in this analysis include National Hydrologic Dataset (NHD) streams and 6th-HUC watersheds, roads, and planned road designations. Datasets that the analysis for this report relied heavily upon include number of stream crossings and length of roadway within 150 feet of streams.

Road sediment-source survey – Roads in some watersheds within the planning area were evaluated in 2008-09 in order to determine points where sediment from roads could be transported to streams. Information collected in this survey includes location information as well as parameters required to predict sediment delivery using the WEPP:Roads model (Elliot et al., 1999).

Roads Analysis Process (RAP) Report – An analysis of the HNF road network was completed in 2004. The analysis designated road risk ratings based on road mileage within riparian habitat conservation areas (RHCA), wet areas, erosive and slide-prone soils, TMDL watersheds, and the number of road-stream crossings (USDA, 2004). The RAP assessment of watershed road risks was compared to more recent GIS data on stream crossings and roads within 150 feet of streams, and found to be consistent. Thus, the latter datasets were used. For discussion of the RAP data, see the fisheries report.

Methodology and Scientific Accuracy

Scale of analysis – The spatial scale of analysis is the 6th-field HUC. This is an appropriate scale for this analysis given the types of watershed impacts that are associated with road networks (e.g. increased sediment delivery) are generally discernible at the 6th-HUC scale. The temporal scale of the analysis for all effects is greater than five years, given that the decision to designate a route as either opened or closed does not necessarily determine whether that route will have a reduced, neutral, or increased impact on water resources in the short-term (less than five years).

GIS data – The accuracy of HNF GIS datasets is described in GIS metadata files in the public record. Updated GIS data on stream-road crossings and miles of road within 150 feet of a stream were used in place of RAP data as indicators of problematic roads. Roads within the 150-foot buffer and number of stream crossings were selected as indicators because a road must be hydraulically connected to a stream in order for sediment-laden runoff to flow from the road to the stream. Roads with stream crossings or that run parallel and adjacent to streams are likely to have sediment delivery points. Roads that are far from a stream are unlikely to be hydraulically connected. This surrogate for field data was used in the analysis because field data for the planning area were incomplete. The distance of 150 feet was chosen as the threshold for negative road-stream interaction because this distance generally affords a buffer of sufficient width to minimize sediment delivery from roadsides. In practice, the width of an adequate sediment buffer depends on buffer slope, vegetation, and other site-specific characteristics. In some instances, a 150-foot buffer may not be sufficient to stop concentrated flow of sediment-laden water from a roadside, but based on experience, in most cases this distance is sufficient in planning area watersheds.

Road sediment data – Road sediment surveys were accomplished by trained HNF hydrologic technicians whose work was field-validated by the forest hydrologist. Data collected in the road sediment survey were of a degree of precision and accuracy that exceeded the sensitivity of the sediment modeling software.

Road sediment modeling – Road sediment modeling (using WEPP:Road software) was done by the forest hydrologist. The accuracy of the model's predictions is dependent on numerous factors, including the limitations of the model in describing physical conditions of the road and soil, as well as the limitations of PRISM-modified local climate data. The WEPP model output used in this report was annual average sediment delivery from the road buffer. The average is based on 50 years of simulated weather events. Actual annual sediment delivery from a road

segment will vary greatly from year to year, depending on such factors as antecedent moisture, snow cover, storm intensity, and storm duration. For additional detail on the WEPP:Road model, see Elliot et al. (1999).

Hydrology, Affected Environment

Analysis Area

The analysis area for the hydrology report analysis consisted of all of the 6th-HUC drainages covered by roads affected in the decision. This includes primarily watersheds in the upper Little Blackfoot River and upper Tenmile Creek watersheds. Several streams within the travel planning area are listed by the Montana Department of Environmental Quality (DEQ) as having impaired water quality. Most of these streams are not fully meeting beneficial uses due to sedimentation, among other impairments. Additionally, some non-listed stream reaches within the planning area flow directly into listed impaired reaches (e.g. Spotted Dog Creek). Streams in the Lake Helena watershed are covered by the Lake Helena TMDL, which recommended a 60% reduction in sedimentation from forest roads (US EPA, 2006). The Holter planning area (in this planning area, streams in the Iron Horse drainage) does not have a TMDL at the time of writing. As of May 2011, the DEQ and collaborators are in the data collection and interpretation process for the Little Blackfoot TMDL.

Water Quality

Forest roads, by virtue of their existence on the landscape, have a negative effect on watershed values. The impact of a road is generally continuous whether the road is open or closed to public use, although unused roads are often partially stabilized by vegetation over time. The Divide Travel Plan decides only the open-closed status of system roads, and does not determine whether or how any system roads will be decommissioned. Thus, the decision likely will not result in any substantial change in the existing impacts of roads on streams and riparian areas within planning area watersheds. The primary benefit to a watershed of such a decision is in the opportunity it affords to subsequently decommission closed roads to remove them from the landscape, following additional NEPA analysis and public review.

The primary water quality concern related to the network of routes in the Divide travel planning area is sediment from roads. Other documented impairments in these watersheds include various metals related mainly to past mining activities, low pH, flow alteration, and alteration of riparian vegetation. This analysis focuses on sediment, as this impairment stems in large part from forest roads in the planning area, and has the greatest potential to be affected by the travel planning decision, assuming subsequent road decommissioning occurs.

Sediment

Roads

Unpaved roads are a dominant source of sediment in most forested drainages, including the 6th-HUC watersheds covered by this travel plan. Specifically, unpaved roads (especially native-surface roads) that cross or run alongside of streams generally deliver sediment to streams during rain and snowmelt events. In contrast, roads without a hydraulic connection to a stream channel may lose eroded sediment from the road surface, but do not deliver sediment to stream channels and are thus generally not a stream water quality concern. Road and culvert maintenance and gravel surfacing can reduce the number or magnitude of sediment delivery

points on a road for a period of years, but a road hydraulically connected to a stream will remain an episodic source of sediment as long as it remains on the landscape. Thus, the most important indirect indicators of the potential for road sedimentation in streams are the number of road-stream crossings and the length of road near a stream. Not surprisingly, the number of observed sediment delivery points increases with the length of road near a stream and the number of stream crossings (Table 3). The HNF Roads Analysis Process (RAP) evaluated the road network on the Forest. The parameters used in determining the potential impact of roads on water quality in the RAP are essentially the same as presented in Table 3, and are thus not presented in this report.

Table 3.19 Road information for portions of 6th-HUC watersheds within the travel planning area.

6th HUC ID	6th HUC name	Roads (mi)	Roads within 150' of stream (mi)	Stream crossings (#)	Surveyed road sediment delivery points**
100301011401	Upper Tenmile Creek*	68.7	12.1	52	74
100301011402	Middle Tenmile Creek*	30.6	3.5	29	4
100301011403	Greenhorn Creek	32.5	8.1	38	1
100301011404	Skelly Gulch*	8.6	1.0	2	†
100301011406	Lower Tenmile Creek*	8.7	0.8	4	†
100301011502	Upper Silver Creek	14.2	0.6	2	†
100301011801	Iron Horse Creek	34.1	3.0	12	†
170102010501	Ontario Creek	48.3	2.5	19	16
170102010502	Little Blackfoot River-Larabee Gulch*	10.3	4.3	19	9
170102010503	Telegraph Creek*	60.5	9.0	55	37
170102010504	Mike Renig Gulch	17.7	1.8	6	8
170102010505	Upper Dog Creek*	92.1	12.0	61	†
170102010506	Lower Dog Creek*	35.0	1.0	5	†
170102010507	Little Blackfoot River-Hat Creek*	44.0	3.7	18	12
170102010601	North Trout Creek	23.0	3.5	11	†
170102010602	Snowshoe Creek*	35.0	4.5	14	†
170102010603	Little Blackfoot River-Elliston Creek*	29.4	1.7	7	9
170102010604	Carpenter Creek	33.1	3.7	16	†
170102010605	Trout Creek	21.1	0.1	1	2
170102010606	South Fork Spotted Dog Creek	1.0	0.2	2	1

6th HUC ID	6th HUC name	Roads (mi)	Roads within 150' of stream (mi)	Stream crossings (#)	Surveyed road sediment delivery points**
170102010607	Upper Spotted Dog Creek	24.8	1.0	6	5
170102010610	Threemile Creek	5.3	1.2	1	†

* watershed contains a stream on Montana 303(d) list as impaired (in part) by sedimentation—see Table 2
** surveyed by HNF hydrology personnel during the 2008 and 2009 field seasons
† minimal road length on HNF in watershed; not surveyed recently

Table 3.20 Streams in the Divide travel planning area listed as impaired by sediment by the Montana DEQ (Montana DEQ, 2008).

Sixth-HUC ID	Sixth HUC Name	Stream Name
100301011401	Upper Tenmile Creek	Tenmile Creek
100301011402	Middle Tenmile Creek	Tenmile Creek
100301011403	Greenhorn Creek	None
100301011404	Skelly Gulch	Skelly Creek
100301011406	Lower Tenmile Creek	Tenmile Creek
100301011502	Upper Silver Creek	None
100301011801	Iron Horse Creek	None
170102010501	Ontario Creek	None
170102010502	Little Blackfoot River-Larabee Gulch	Little Blackfoot River
170102010503	Telegraph Creek	Telegraph Creek
170102010504	Mike Renig Gulch	None
170102010505	Upper Dog Creek	Dog Creek
170102010506	Lower Dog Creek	Dog Creek
170102010507	Little Blackfoot River-Hat Creek	Little Blackfoot River
170102010601	North Trout Creek	None
170102010602	Snowshoe Creek	Snowshoe Creek
170102010603	Little Blackfoot River-Elliston Creek	Little Blackfoot River
170102010604	Carpenter Creek	None
170102010605	Trout Creek	None

Sixth-HUC ID	Sixth HUC Name	Stream Name
170102010606	South Fork Spotted Dog Creek	None
170102010607	Upper Spotted Dog Creek	None
170102010610	Threemile Creek	None

Fifty percent of the 6th-HUC watersheds covered by the travel planning area contain a stream that is impaired by sediment, including nearly all of the major streams in this area. In part as a result of sediment impairment, all of these impaired stream reaches are not fully meeting the aquatic life and cold water fishery designated beneficial uses (MT DEQ, 2008). Sediment delivery from system and non-system roads in Tenmile and Sevenmile Creeks were estimated in the Lake Helena Total Maximum Daily Loads (TMDL) at 13% and 12% of total sediment load, respectively. The TMDL recommends a 60% reduction in system road sediment delivery reduction, and 100% for non-system roads (US EPA, 2006).

In addition to sediment delivery from roads, the presence of culverts (particularly those that are undersized) at road-stream crossings present a potential risk of sedimentation in any stream. During a flood event, especially following a wildfire, a culvert can become partially or fully obstructed, leading to failure of the crossing. The frequent consequence of culvert failure is the erosion and entrainment of road fill around the culvert.

Table 3.21 Road information for portions of 6th-HUC watersheds within the travel planning area.

6th HUC ID	6th HUC name	Roads (mi)	Roads within 150' of stream (mi)	Stream crossings (#)	Surveyed road sediment delivery points**
100301011401	Upper Tenmile Creek*	68.7	12.1	52	74
100301011402	Middle Tenmile Creek*	30.6	3.5	29	4
100301011403	Greenhorn Creek	32.5	8.1	38	1
100301011404	Skelly Gulch*	8.6	1.0	2	†
100301011406	Lower Tenmile Creek*	8.7	0.8	4	†
100301011502	Upper Silver Creek	14.2	0.6	2	†
100301011801	Iron Horse Creek	34.1	3.0	12	†
170102010501	Ontario Creek	48.3	2.5	19	16
170102010502	Little Blackfoot River-Larabee Gulch*	10.3	4.3	19	9
170102010503	Telegraph Creek*	60.5	9.0	55	37
170102010504	Mike Renig Gulch	17.7	1.8	6	8
170102010505	Upper Dog Creek*	92.1	12.0	61	†

6th HUC ID	6th HUC name	Roads (mi)	Roads within 150' of stream (mi)	Stream crossings (#)	Surveyed road sediment delivery points**
170102010506	Lower Dog Creek*	35.0	1.0	5	†
170102010507	Little Blackfoot River-Hat Creek*	44.0	3.7	18	12
170102010601	North Trout Creek	23.0	3.5	11	†
170102010602	Snowshoe Creek*	35.0	4.5	14	†
170102010603	Little Blackfoot River-Elliston Creek*	29.4	1.7	7	9
170102010604	Carpenter Creek	33.1	3.7	16	†
170102010605	Trout Creek	21.1	0.1	1	2
170102010606	South Fork Spotted Dog Creek	1.0	0.2	2	1
170102010607	Upper Spotted Dog Creek	24.8	1.0	6	5
170102010610	Threemile Creek	5.3	1.2	1	†

* watershed contains a stream on Montana 303(d) list as impaired (in part) by sedimentation—see Table 2

** surveyed by HNF hydrology personnel during the 2008 and 2009 field seasons

† minimal road length on HNF in watershed; not surveyed recently

Non-Road Sediment Sources

Stream bank erosion occurs in undisturbed drainages as a part of natural channel geomorphic processes, but can be accelerated by management, most commonly cattle trampling on grazing allotments. Along several planning area streams, bank trampling was evaluated by HNF hydrology crews during the summer of 2008 using the Region 1 Bank Alteration Protocol (Enk et al., 2005)—several reaches were impacted by bank trampling. Although this information is now somewhat dated, trampled stream banks are likely a continuing source of sediment to area streams. The Lake Helena TMDL estimated that anthropogenic stream bank erosion accounted for 11% and 16% of the total sediment loading in Tenmile Creek and Sevenmile Creek, respectively, although much of the sediment generated from eroding stream banks comes from agricultural areas downstream of the forest boundary (US EPA, 2008). Along other streams within the planning area, accelerated stream bank erosion due to past mining activities and cattle grazing is likely occurring.

Other sources of sediment in planning area streams include natural watershed erosion, erosion from timber harvest activities on private and federal land, and abandoned mining lands (see cumulative effects list). Aside from natural erosion, these sources likely contribute less sediment than erosion from roads, based on estimates made in the Lake Helena and other area TMDL reports (US EPA, 2006; Montana DEQ, 2004).

Non-Sediment Impairments

A dominant impairment of stream water quality in the study area is elevated metals from past mining activities. For example, following the failure of an adit in the Tramway Creek drainage, flow from the adit delivered elevated metals loads to the Little Blackfoot River for several weeks

during the winter of 2008-09 (metals contamination in the flow from this adit has greatly diminished since the adit failure). Another vector for metals transport to streams is contaminated roads—where mine waste rock was used in road construction (e.g. Rimini Road along Tenmile Creek. Many of the 6th-HUC watersheds in the planning area are not fully meeting designated beneficial uses as a result of metals impairments.

Water Yield

Water yield in most if not all of the drainages in the planning area will likely be measurably greater than baseline conditions as a result of widespread tree mortality from insect infestation, in concert with other activities that have removed large numbers of trees from the watersheds (e.g. green-tree timber harvest) over the past few decades. Baseline conditions are defined to be the expected water yield given a natural extent of forest cover throughout a watershed. In practice, the concept of a static baseline water yield is of limited value, as forest cover in undisturbed watersheds is generally in a state of flux based on several factors, including fire and insect-induced mortality.

Water yield would not be meaningfully affected by a decision under any alternative of the Divide travel plan, as it would designate only open and closed routes. Even if the plan facilitates the eventual removal of roads from the landscape and recovery of forest on former road beds, the area of trees gained would be insignificant with respect to basin water yield at the 6th-HUC scale. Decommissioning several hydraulically connected roads in a watershed might alter the flow regime marginally, as the high-efficiency vectors of runoff (roads) are removed from the landscape, although this too would be difficult to measure.

Riparian Conditions

The term riparian refers to an area at the interface of land and water. Riparian areas are important ecological niches on the landscape of the analysis area. The condition of riparian areas within the travel planning area varies widely. Within grazing allotments, riparian areas are generally impacted by cattle grazing and trampling. Several stream riparian areas were evaluated by HNF hydrology technicians using the Proper Functioning Condition (PFC) protocol (Prichard, 1998) during the summer of 2008. This approach specifies field review by an interdisciplinary team of resource specialists—because this dataset was not collected by such a team, these results are preliminary. The PFC methodology qualitatively evaluates riparian area vegetation, channel, and floodplain characteristics to arrive at an estimate of how well the riparian area functions in dissipating flow energy and maintaining floodplain stability during larger flood events. Past mining, livestock and native ungulate grazing, browsing, and trampling, and other land use activities can all negatively impact riparian area form and function. Streams outside of grazing allotments and past mining areas have in the past generally been rated as properly functioning.

Hydrology, Environmental Consequences

Effects Common to All Alternatives

Road maintenance and improvements unrelated to this decision, but carried out as part of routine operations or as part of future projects, would generally reduce sediment delivery from system routes to streams for a period of years following the work.

Effects Common to All Action Alternatives

The action alternatives would each designate HNF system routes. Roads or trails not designated system routes would by default be considered unauthorized routes, and would be available for decommissioning. Alternative 1 does not identify unauthorized routes as available for decommissioning. Thus, implementation of Alternatives 2, 3 or 4 likely would result in a somewhat improved water quality and riparian conditions within the planning area. This conclusion is based on the assumption that unauthorized routes that impact water quality or riparian conditions would be decommissioned as watershed improvement projects in the first few years following the decision. However, the potential unauthorized route decommissioning would not be mandated by the decision, and therefore cannot be considered a direct or indirect effect of the decision.

Unauthorized routes in areas detrimental to water quality and riparian area form and function do exist on the landscape, although they have not been comprehensively surveyed. Thus, the potential value of their removal from the landscape is not quantifiable for this report.

Alternative 1, No Action

Direct, Indirect, and Cumulative Effects

Under Alternative 1, no new management actions are proposed. If no new actions are undertaken, no new management-related water resource impacts would occur. Past and ongoing management activities, such as road use, OHV use, mining, and livestock grazing would continue to affect water resources. No new additions to watershed-scale cumulative effects would be predicted, because no new management activities are proposed with Alternative 1.

Irreversible and Irretrievable Commitments

An irretrievable commitment represents a temporary loss of a resource, which can be replaced over time. An irreversible commitment represents a total loss of a resource, which cannot be replaced. An irretrievable commitment of the alternative 1 would be continued sediment delivery to streams from the existing road network, and continued impact to riparian areas traversed by roads. There are no irreversible commitments from this alternative.

Alternatives 2, 3, 4

Direct and Indirect Effects

Direct and indirect effects of the three action alternatives are essentially the same, and are therefore presented together. Direct and indirect effects of the action alternatives are also similar to those of the no-action alternative, in that no new construction is proposed, and no system roads are specified for decommissioning. New construction and decommissioning would be left to subsequent analysis. However, implementation of all action alternatives would set the stage for decommissioning of all unauthorized routes. As stated above, the impacts of unauthorized routes on water resources in the planning area have not been quantified, but are likely to be considerable.

An additional indirect benefit of the action alternatives to water resources in the planning area lies in their designation of routes. By placing all routes in the planning area into one of several categories, the three action alternatives provide the framework for future projects to

decommission roads. Any route designated as closed to wheeled motorized vehicles year-round could be decommissioned following separate, subsequent NEPA analysis. The routes that fit this definition include routes with the designated map code of *01-closed, 06-over-snow vehicles only,* and *NS-01-Res (non-system routes).* All of the action alternatives have more miles of roads in these categories that are within 150 feet of a stream channel than does the no-action alternative (Table 3.22) because alternatives 2, 3 and 4 incorporate approximately 9 or 10 miles of routes that were previously classified as non-system. Similarly, roads in these categories under the action alternatives have a higher number of stream crossings than do those under the no action alternative (Table 3.23), again because of the incorporation of miles that were previously unauthorized. However, only the action alternatives provide a mechanism by which to eventually decommission unneeded stream crossings. The potential for road decommissioning does not constitute a direct or indirect effect resulting from the travel planning decision, but it should be considered a benefit. Additionally, the *de facto* recognition of all unauthorized routes would be available for decommissioning is an indirect effect of all three action alternatives, in that the full benefit to watershed values would not be realized until the routes were decommissioned—this decision would not specify the decommissioning of these routes.

The main difference among the three action alternatives is in the total number of miles of road within 150 feet of a stream and number of stream-road crossings available for future decommissioning (Tables 3.22 and 3.23). However, because no road decommissioning would occur as a direct result of this decision, these differences are generally not pertinent to direct or indirect effects of the alternatives. There would likely be some indirect benefit to watershed conditions in the effective closure of roads to all use, in that over time these roadbeds could be expected to revegetate and stabilize. However, without decompaction and recontouring, restoration of subsurface flow-path connectivity and soil productivity would not be realized. In any case, the differences do give Alternative 3 the greatest potential for future work that would benefit watershed values.

Irreversible and Irretrievable Commitments

An irretrievable commitment represents a temporary loss of a resource, which can be replaced over time. An irreversible commitment represents a total loss of a resource, which cannot be replaced. An irretrievable commitment of the action alternatives would be continued sediment delivery to streams from the existing road network, and continued impact to riparian areas traversed by roads. Another irretrievable commitment to the action alternatives would be a greater difficulty in decommissioning roads known to be water quality problems that are designated as open to wheeled traffic for at least part of the year. While future closing and decommissioning any route is not precluded by an “open” classification in this travel plan, it would be more difficult to accomplish once a decision has been signed. There are no irreversible commitments from this alternative.

Table 3.22 Miles of road within 150 feet of a stream channel that are available for future decommissioning.

6th HUC ID	6th HUC name	Available for decommissioning (mi)			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4
100301011401	Upper Tenmile Creek	1.2	1.2	1.2	1.2
100301011402	Middle Tenmile Creek	0.6	0.5	0.8	0.5
100301011403	Greenhorn Creek	0.2	3.0	3.0	3.0
100301011404	Skelly Gulch	0.1	0.7	0.7	0.7
100301011406	Lower Tenmile Creek	0	0	0	0
100301011502	Upper Silver Creek	0	0.6	0.6	0.6
100301011801	Iron Horse Creek	0.5	0.5	0.5	0.5
170102010501	Ontario Creek	0.7	0.4	0.7	0.5
170102010502	Little Blackfoot River-Larabee Gulch	0	0.4	0.8	0.6
170102010503	Telegraph Creek	3.1	4.0	4.0	4.0
170102010504	Mike Renig Gulch	1.8	1.6	1.8	1.8
170102010505	Upper Dog Creek	0.3	2.5	2.5	2.5
170102010506	Lower Dog Creek	0	0.1	0.1	0.1
170102010507	Little Blackfoot River-Hat Creek	1.3	1.7	2.5	1.7
170102010601	North Trout Creek	0	0	0	0
170102010602	Snowshoe Creek	0.7	1.2	1.2	1.2
170102010603	Little Blackfoot River-Elliston Creek	0.7	0.2	0.7	0.7
170102010604	Carpenter Creek	2.9	2.9	2.9	2.9
170102010605	Trout Creek	0	0	0	0
170102010606	South Fork Spotted Dog Creek	0.1	0.1	0.2	0.2
170102010607	Upper Spotted Dog Creek	0.1	0.1	0.7	0.5
170102010610	Threemile Creek	1.2	1.2	1.2	1.2
TOTAL		15.5	22.4	26.1	24.4

Cumulative Effects

In addition to the impacts of sediment delivery from roads and road impacts on riparian area and stream form and function, several past and present federal and non-federal activities have affected and continue to affect water quality and yield and riparian health and vigor in the cumulative effects analysis area. Past timber harvest has likely caused temporary increases in water yield and sediment delivery, though these effects generally attenuate over time. In the past, mining has contributed metals and sediment to stream channels in the watersheds. In some cases, ongoing mining activity continues to be a chronic source of sediment to streams and of riparian degradation. Old mine workings can also pose chronic or episodic water quality problems to forest streams, as in the Tramway Creek (Little Blackfoot) adit-plug failure of November 2008. Past pulses of elevated sediment (e.g. from timber harvest or mining) can remain stored in stream channels (banks, bed, floodplain) for many years following deposition. Continued grazing in riparian areas and cattle trailing along streams within grazing allotments would likely continue to contribute elevated sediment levels to streams in watersheds with grazing allotments. Road work completed in recent years should reduce erosion and sediment delivery from certain project-area roads (Appendix B). Thus, some past and ongoing activities have been and continue to generate elevated sediment delivery, whereas other activities will reduce sediment delivery. This decision will not directly result in measurable additions to or reductions from cumulative watershed effects.

Table 3.23 Number of stream crossings on roads that are available for future decommissioning

6th HUC ID	6th HUC name	Available for decommissioning (#)			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4
100301011401	Upper Tenmile Creek	5	5	5	5
100301011402	Middle Tenmile Creek	7	4	8	7
100301011403	Greenhorn Creek	0	9	9	9
100301011404	Skelly Gulch	0	1	1	1
100301011406	Lower Tenmile Creek	0	0	0	0
100301011502	Upper Silver Creek	0	2	2	2
100301011801	Iron Horse Creek	1	1	1	1
170102010501	Ontario Creek	7	4	7	5
170102010502	Little Blackfoot River-Larabee Gulch	0	0	2	1
170102010503	Telegraph Creek	19	17	22	22
170102010504	Mike Renig Gulch	5	4	5	5
170102010505	Upper Dog Creek	2	7	7	7
170102010506	Lower Dog Creek	0	1	1	1
170102010507	Little Blackfoot River-	6	11	13	11

6th HUC ID	6th HUC name	Available for decommissioning (#)			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4
	Hat Creek				
170102010601	North Trout Creek	0	0	0	0
170102010602	Snowshoe Creek	4	5	5	5
170102010603	Little Blackfoot River-Elliston Creek	3	1	3	3
170102010604	Carpenter Creek	11	11	11	11
170102010605	Trout Creek	0	0	0	0
170102010606	South Fork Spotted Dog Creek	1	1	2	2
170102010607	Upper Spotted Dog Creek	2	2	5	4
170102010610	Threemile Creek	1	1	1	1
TOTAL		74	87	110	103

In planning-area watersheds, water yield most likely has been and would continue to be affected by large-scale tree mortality. Large-scale loss of live trees reduces the volume of water removed from a watershed by transpiration. Increases in water yield could result in higher peak flows than would otherwise occur—higher flows have the potential to increase stream bank and bed scour. As discussed above, none of the alternatives would meaningfully affect water yield.

Extensive tree mortality would also affect stream temperature in streams that cross the affected stands. However, understory vegetation, generally unaffected by insect mortality, would continue to provide shade. Furthermore, understory and riparian vegetation exposed to increased levels of sunlight (due to loss of overstory canopy) can expand and provide additional shade (Gravelle & Link, 2007). None of the alternatives would measurably influence stream temperature.

Reasonably foreseeable federal and non-federal activities that could affect water quality and yield and riparian health and vigor in the cumulative effects analysis area include future timber harvest, small-scale mining or failure of old mines, continued livestock impacts, roads, and fire. Foreseeable timber harvest activities in the analysis area (e.g. hazard tree removal) on the national forest are not likely to substantially affect water quality or riparian area viability, assuming compliance with the SMZ law and strict adherence to forestry BMPs (Montana DNRC, 2008). Timber-sale road improvements (e.g. Telegraph Project) would be expected to reduce sediment delivery from project-area roads through implementation of road BMPs. The impacts of roads on water quality, as outlined in the “Affected Environment” section of this report, would not be altered as a direct result of either of the action alternatives. However, the action alternatives lay the groundwork for future road decommissioning, which if implemented would reduce sediment delivery from forest roads. Other activities that would serve to reduce sediment delivery to streams in project watersheds would likely be implemented periodically in

the future within the cumulative effects analysis area. Such activities include watershed improvement projects, culvert upgrades, and effectively implemented allotment management plan (AMP) revisions, among others.

Conclusions

Alternative 1, No Action

Currently, full attainment of all beneficial uses in streams is not being met in several of the 6th-HUC watersheds within the travel planning area. In some of these impaired streams, beneficial uses are compromised due at least in part to land-use activities off of the Helena National Forest. Under the no-action alternative, full attainment of all beneficial uses would still not be met in these watersheds. Existing activities (e.g. forest roads) on the HNF portions of these watersheds might in some cases not meet the state requirement that "all reasonable land, soil and water conservation practices have been applied" (ARM 17.30.602) to minimize pollution, although effects of forest roads and other management practices in place before April 1993 are exempt from this standard (MCA 75-5-317). This exemption notwithstanding, many of these roads could be considered to "cause excessive water pollution" (HNF Forest Plan, II/25) and should thus be "corrected where feasible" (*ibid.*), or stand in violation of the Forest Plan. Finally, no planning for road decommissioning in the planning area can move forward in the absence of a travel plan decision. With these matters considered, Alternative 1 would hold the least promise of the alternatives for future work to reduce the impact of the Forest's road network on water quality and riparian conditions.

Alternatives 2, 3, 4

The action alternatives are similar to Alternative 1 in that the open-or-closed constraint of this decision would not specifically provide for actions that would alleviate current water quality problems in the planning area. Thus, the remarks above under Conclusions—*Alternative 1* also apply to Alternatives 2 through 4, with the important exceptions that the action alternatives would provide the framework for future system road decommissioning, and allow decommissioning of unauthorized routes, many of which are causing water-resource concerns.

From the standpoint of protecting watershed values and reducing impacts of the HNF travel system on water quality, a travel planning decision that contained specific road closure measures would be more desirable than one that offered only open-or-closed prescriptions. Furthermore, many routes that are known sediment sources to streams that are on the Montana list of water-quality-limited segments (WQLS) would remain open under all action alternatives. Additionally, Alternatives 2 and 4 would include re-opening of some routes that are currently closed year-round. Nonetheless, because the action alternatives presented in this document do represent a net reduction in open road miles within 150 feet of or crossing a stream, the decision would be a first step toward actual route closure and decommissioning. Thus, any of the action alternatives are preferable to the no-action alternative, and would move toward Forest Plan consistency on the maintenance of acceptable water quality in streams on the National Forest. The implementation of this plan would also move the Forest toward meeting the Lake Helena and Little Blackfoot TMDL sediment reduction goals.

Forest Plan Consistency

Alternative 1 is arguably not consistent with Forest Plan direction in that some water bodies in the planning area are not currently meeting state water quality standards (i.e. several streams

are on the Montana *303(d)* list of WQLS). Under this alternative and the scope of this decision, the Forest would not move toward meeting this Forest Plan standard because no measures targeted at improving water quality of planning area streams would be implemented.

The proposed travel plan, under any of the action alternatives, does not specify any activities that would directly result in the degradation of water quality in the planning area. In this sense, the travel plan is in compliance with the FP standard requiring that a project resulting in water pollution be modified or discontinued (see *Regulatory Framework* above). The plan is also consistent with the FP standard requiring that BMPs are employed in projects to minimize non-point-source pollution, in that routes designated as system routes would be required to be maintained at appropriate standards, and unauthorized routes would be available to be removed from the landscape. While the Decision does not directly specify road improvements or decommissioning, its route designations set the stage for this work.

FISHERIES

Regulatory Framework

1976 National Forest Management Act

Under the National Forest Management Act of 1976 (NFMA), the Forest Service is charged with maintaining the viability of all existing native and desired non-native vertebrate species in a planning area (36 CFR 219.20). A forest plan must identify "management indicator species" (MIS) that serve as proxies for fulfilling this NFMA viability requirement. Westslope cutthroat trout (WCT) is the fisheries MIS on the Helena National Forest. The regulations impose a standard by requiring habitat objectives to be established for maintaining viability of MIS throughout a planning area.

Endangered Species Act (Act) of 1973

The Endangered Species Act of 1973 (section 2) is designed to protect imperiled species, which are officially listed as "endangered" or "threatened", from extinction as a "consequence of economic growth and development untempered by adequate concern and conservation." The stated purpose of the Act is to provide a means to protect listed species and "conserve the ecosystems upon which they depend." Bull trout are listed as a "threatened" fish species under the ESA and occur west of the Continental Divide on the Helena National Forest within the Upper Clark Fork and Blackfoot River subbasins.

Section 7(a)(2) of the Act states each Federal agency shall, in consultation with the Secretaries of Interior and Commerce (Secretary), insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated "critical habitat." This section of the Act defines the consultation process, which is further developed in regulations promulgated at 50 CFR §402.

Section 7(a)(1) of the Act makes clear that all Federal agencies should participate in the conservation and recovery of listed threatened and endangered species. It directs all other Federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of species listed pursuant to the Act. Under this provision, Federal agencies often enter into partnerships with the Fish and Wildlife Service for implementing and funding conservation agreements, management plans, and recovery plans developed for listed species.

Pertinent also to this project is road management guidance in the Biological Opinion on Forest Plans (USDI 1998, pgs 23, 24, 71-73, 82, 89, 90, 94, 95, 100) that emphasize commitments to implement existing standards in INFISH for ESA listed fish. Specific INFISH standards RF-2, RF-3 and RF-4 will be a priority as discussed under the Helena National Forest Plan. From a dispersed and developed recreation aspect, standard RM-2 (pg 9) specifies *where adjustment measures such as education, use limitations, traffic control devices, and/or specific site closures fail to meet Riparian Management Objectives and avoid adverse effects to native fish habitat, eliminate the practice or occupancy*. The 1998 BO (pg 89) emphasizes *given the negative impact of roads on aquatic species and a habitat, moving forward on the development of comprehensive plans addressing road system related effects is extremely important to bull trout conservation*.

Helena National Forest Plan

Direction for fisheries management under the Helena National Forest Plan (USDA 1986) emphasizes "maintenance or enhancement" of cold-water habitat and water quality to meet the needs of fisheries (Forest Plan pages II-1 and II-4). The general forest-wide standard (pg II-22) states: Maintain quality water and habitat for fish by coordinating activities and by direct habitat improvement. The analysis will also identify opportunities, if any exist, for mitigating adverse effects on water related beneficial uses.

For road management (pgs II-31 to II-32), the Plan states that unacceptable damage to soils, watershed, fish, wildlife, or historical/archaeological sites will be mitigated by road restrictions or other road management actions as necessary. Forest specialists representing soils and watershed shall provide input to the road maintenance planning process to verify standards, identify rehabilitation needs, and designate roads which should be permanently closed for resource protection. Road standard # 3 (pg II-30) provides where forest specialists representing soils, watershed, and fisheries shall identify potential soil erosion, water quality and fisheries problems and provide input, including mitigation measures, to the development of road design standards.

In riparian areas, page II-35 of the Forest Plan specifies that wet meadows and wet areas are closed to ORV use. Construction of roads will avoid stream course encroachment and channelization, including the avoidance of all riparian areas except to cross them. In addition, the Plan states the Forest will provide for vegetative cover adjacent to streams to serve as a filter strip for sediment and maintain optimum water temperatures, as well as provide large debris for long-term instream fish cover and pooling. For stream crossings, Plan standards call for stream crossing structure design that allows free water flow and fish passage. Additionally, the Plan requires riparian areas are to be managed compatible with dependent wildlife species.

The Forest Plan (USDA 1986) was amended on August 30, 1995 to incorporate the Inland Native Fish Strategy or INFISH (USDA Forest Service 1995). This interim strategy was designed to provide additional protection for existing populations of native trout, especially bull trout, outside the range of anadromous (moving from ocean to fresh water to spawn) fish, on 22 National Forests in the Pacific Northwest, Northern and Intermountain Regions throughout the Columbia River Basin. This strategy, therefore, applies to riparian habitats for only those watersheds west of the Continental Divide in the Divide travel planning area. INFISH established Riparian Management Objectives (RMOs) and Riparian Habitat Conservation Areas (RHCAs) including project and site-specific standards and guidelines for drainages west of the Divide in the interior Columbia River. INFISH standards pertinent to this project include road standards RF-2, RF-3 and RF-4. RF-3c *requires closing, stabilizing, or obliterating roads not*

needed for future management activities and prioritizing these actions based on current/potential damage to inland native fish in priority watersheds.

Forest Service Manual

The Forest Service Manual (FSM) contains legal authorities, policies, instructions and guidance needed in the proper management of aquatic resources. Where other resource activities have potential to impact fish habitat, FSM 2634 provides for integrating prescriptions during project planning to help meet fisheries habitat objectives and to mitigate adverse impacts of resource management activities. After a half-century of rigorous research, fine sediment originating from a broad array of human activities has been singled out as the principal factor in the degradation of stream fisheries (Waters 1995, pg 79). Water quality management shall recognize sediment as the major non-point pollutant from FS lands and establish guidelines and procedures for preventing unacceptable resource impacts from introduced sediment (FSM 2542.02).

In addition, FSM 2672.1 imposes a strict standard for treatment of sensitive species. The Forest Service designates westslope cutthroat trout (WCT) as "sensitive" and, therefore, confers special attention in their management to ensure their viability and to preclude trends toward endangerment that would result in warranting listing under the Endangered Species Act. A biological evaluation (BE) is required to be completed to display the effects of the selected alternative.

Assumptions

Although forest management activities may differ widely, they impact streams principally in the following ways:

- Increased sedimentation.
- Alterations of channel morphology.
- Loss of fish habitat connectivity.

By far, roads produce the most sediment generated amongst forest activities, particularly if located near streams (Anderson 1971, Anderson et al. 1976, Cederholm et al. 1981, Furniss et al. 1991), and they often create conditions for mass soil failures and landslides (Waters 1995). Alterations in channel morphology also can result wherever roads are built parallel to streams and at flow restrictions such as culverts, which commonly end up being fish migration barriers (Furniss et al. 1991). Ford crossings also present their own risks since they provide a direct linkage of the road to surface water where vehicles directly drive through the channel. In such cases traffic generally causes the stream to widen and can direct kill fish larvae or fry it located in or close to sensitive spawning and rearing areas.

This analysis draws upon the following assumptions:

- The *stream road proximity* indicator (high risk roads within 300 feet of a stream) provides a reasonable approximation of the hydrologic connectivity (sedimentation) and physical alterations on streams.
- The *road-stream intersections* indicator gives a reasonable estimate of stream crossings associated with the transportation system that act as sediment delivery sites and fragment aquatic habitats.
- Used together these two indicators—road-stream intersections and roads within 300 feet of a stream (high-risk roads)--respond most predictably and reliably to the proposed action as a barometer of potential change.

- The primary effect to salmonid fish and habitat is associated with sediment delivery from high risk roads and the presence of stream-route intersections.
- Sediment delivery and deposition in stream channels is an important source of mortality to trout. Other variables (temperature, dissolved oxygen, food, cover, and angler harvest) are outside the scope of this analysis as the project focus is on designating routes open for motorized vehicle use and gating selected roads identified for closure.
- Critical channel reaches (core sampling reaches) within a watershed can be used to estimate sediment effects on the entire stream.
- For the purposes of this analysis, roads defined as "closed" include all those with the following restriction codes: 01, 06, NS-01, MT-01 and NONMT. The "06" restricted roads are closed year-round to motorized use except snowmobiles are allowed due to surrounding lands being available for over-snow use. All *high risk* roads, whether open or closed in this travel analysis can be considered for future obliteration/recontour projects as determined to protect soil, watershed and fish resources.
- It is assumed that over snow travel with snowmobiles presents no sediment risk to streams except at stream ford crossings.
- Sediment risk associated with winter travel increases on "high risk" road segments when wheeled vehicles needed to accommodate both motorized (snowmobile) and non-motorized recreationists travel these routes during periods of winter/spring time thaws. The erosion and rutting hazard on roads becomes high under rapidly warming weather conditions (e.g chinook winds) greatly increasing the potential for roadtop materials to enter the surface water system.

Information Used

Information on fish populations within the Divide planning area was drawn from updated GIS fishery spatial layers and associated linked data. Sources of data for inputs into the forest GIS database came from past and ongoing fisheries electrofishing surveys conducted by Forest Service and FWP fisheries personnel over the past 25-30 years; information contained in fisheries files; previous EIS/EA documents; field updates from more recent electrofishing surveys including westslope cutthroat trout (WCT) subbasin updates completed in winter 2009; WCT biological evaluations; bull trout biological assessments; small project fish reports; and shared information with Montana DFWP fisheries personnel. In regard to bull trout, information from watershed baselines for the Little Blackfoot River portion of the Upper Clark bull trout Section 7 Watershed (USDA 2000) and updates to the U.S. Fish and Wildlife Service was also used.

Information to help characterize fish habitat conditions in the planning area was drawn from sediment and riparian monitoring data, fish habitat condition surveys, fish species and distribution surveys, road sediment and culvert inventories and assessments contained in watershed/fisheries on the Helena National Forest. All resource information was collected by Forest Service fisheries and hydrology personnel over the past 20-25 years. Other information sources included previous EIS/EA documents specific to the Little Blackfoot River watershed, the Divide Landscape Analysis, stream permit applications, westslope cutthroat trout and bull trout biological evaluations, and several small project fisheries reports specific to the upper Little Blackfoot and Tenmile Creek drainages. Watershed baselines for the Little Blackfoot River portion of the Upper Clark bull trout Section 7 Watershed (USDA 2000) including updates to the various subwatershed documents are also used.

Relevant to measures used to evaluate effects of roads on fisheries resources, GIS road and stream coverages helped to estimate the number of *stream-road intersections* and *high risk roads* (those inside 300-foot of streams as related to INFISH buffers). In lieu of limited field data across portions or entire areas encompassed by twenty-six (26) NRCS 6th field Hydrologic Units, the transportation and stream coverages were attributed in GIS as an aid to project ongoing and potential effects on fish habitat from the various alternatives. A roads database for the Divide travel planning area was the basis for monitoring any changes in measures used to evaluate effects on fisheries habitat.

Field data from road sediment inventories and culvert inventories/assessments in 2008 on several sub-watersheds in the planning area were incomplete to provide a good check between the preferred effects indicators and observed effects on the ground. A road by road survey in several sub-watersheds in the travel plan area was started; however, more road survey data collection within the Divide Travel area is needed.

Methodology and Scientific Accuracy

This report follows procedures outlined in Report FS-683, *Roads Analysis: Informing Decisions About the National Forest Transportation System* (USDA Forest Service, 1999) customized to local situations. The effects section takes the broad-scale forest wide roads analysis down to the finer sub-watershed scale (6th field hydrologic unit code) specific to the Divide travel planning area. Key road-related issues identified were: stream substrate conditions, road proximity to streams, and stream crossings/intersections. Two measures determined most useful at quantifying these important road-fish habitat interactions were: 1) *high risk roads (roads within 300 feet of streams*) and, 2) *stream-road intersections (crossings)*.

These two measures used to evaluate effects were chosen with an understanding about how the mechanisms of impact to fish habitat (sediment, channel alterations, and habitat fragmentation) are tied specifically to high risk roads and stream crossings. Therefore, the road and stream coverages were attributed in GIS for all sub-watersheds encompassed by the planning area. This GIS-based analysis systematically examined the transportation system aimed at the two measures for evaluating potential effects on fish habitat. Determining miles of high risk road required buffering the stream coverage by a 300-foot distance and clipping out only those road segments within the buffer assuming this approach gives a reasonable approximation of the length of roads within 300 feet of a waterbody. Stream-road intersection points were produced by intersecting the road and stream layers and placing the intersection nodes into a point-coverage.

Streams delineated on topographic maps may, however, under-represent actual streams; conversely crenulated contour coverages may over-represent streams depending on the rules applied and individual crenulator (USDA Forest Service, 1999, pgs 140 and 180). The accuracy of the indicators in this analysis is probably moderate at best. Past travel plan analyses found that comparing GIS based *stream-route intersections* with actual on-the-ground measurements amongst four arterial routes within the North Belts Travel Plan area indicated the GIS coverages over-represent this indicator on average about 30%. Conversely, field checking *stream-road intersections* for the Cabin Gulch Vegetation Treatment project found that GIS-based *stream-road intersections* were under-represented up to 45% of the actual number of intersections in East Cabin Gulch, yet GIS coverages over-represented this indicator 21% in the North Fork Deep Creek. Therefore, this analysis more appropriately gives a reasonable measure of relative differences between the alternatives.

The effectiveness of a particular road closure treatment was based on how effective a closure prescription is at removing one or both road elements of concern from baseline values consistent with the approach applied in the North Belts Travel Plan project (USDA Forest Service 2005). Rationale for how effective various road treatments were for travel planning purposes can be found in the project file for the North Belts Travel EIS. Closure recipes judged "highly" effective were those fully eliminating both road elements from a closed segment, while closure recipes judged "moderately" effective physically eliminated one, but not both road elements. The closure method applied in this project simply would sign closed roads. Although the Divide travel plan would administratively close roads and would not be as effective as physically removing the two road elements of concern for fisheries, closing roads and crossings adversely affecting fisheries provides advantages for potential habitat restoration over time.

To separate the differences amongst alternatives where there is no ground disturbance or physical changes planned to the transportation system under this "open/closed" roads administrative decision, a benefit-risk assessment was performed for each road segment by sub-watershed. The benefits of closing currently open segments of road to motorized use year-round is based on the premise that erosion and sedimentation reduces as a function of passive re-vegetation of closed roadbeds over the long term. Additionally, closing roads permanently sets the stage for future road treatment opportunities that fully restore drainages to contour over the long-term. Risk of closing open roads is based on assumptions about culvert crossing failure as a function of reduced road monitoring and maintenance. Conversely, the consequence of opening currently closed segments of road to motorized use is the potential to destabilize the road bed and inhibit re-vegetation over the long term. Additionally, access decisions to open closed roads have major implications for the extent and nature of recreational use and subsequent effects on fish habitat (Clark and Gibbons 1991, pg 476).

Fisheries, Affected Environment

Introduction

This section is organized under two major subsections: fish populations and fish habitat. The first discusses the current known distribution and status of fish populations in the Divide Travel area including discussions about non-native and native fish species that occupy planning area streams. The second subsection gives an overview of stream habitat conditions and trends as influenced by past and ongoing land-use activities that can affect fish populations.

Analysis Area

The Divide travel planning area encompasses twenty-six (26) National Resource Conservation Service (NRCS) 6th field HUCs (Hydrologic Unit Code), commonly referred to as sub-watersheds. Four sub-watersheds are dropped from the fisheries analysis area since there are no fish populations and/or no roads occurring in the portion of these sub-watersheds encompassed by the Divide travel planning area. Therefore, twenty-two sub-watersheds---seven east of the Continental Divide (Divide) and fifteen west of the Divide--- are considered for potential effects to fisheries resources in this travel planning decision.

Natural processes and landuse activities unique at the sub-watershed scale influence local fish habitats independently of other sub-watershed units. Logically the geographic unit of preference is delineated at the sub-watershed (6th-field HUC) scale as the area for examining

direct/indirect and cumulative effects in the fisheries analysis area. It is possible, however, for water quality in a sub-watershed to be influenced by activities in another sub-watershed located upstream from it.

Fish Populations in Planning Area

The Divide travel planning area straddles both east and west sides of the Continental Divide and includes six fishbearing sub-watersheds in the Upper Missouri 4th field HUC (sub-basin) and fifteen fishbearing sub-watersheds in the Upper Clark Fork 4th field HUC. Table 3.24 lists six sub-watersheds east of the Divide having streams supporting a fishery. One of the seven eastside watersheds having no fish populations on forest is Lower Tenmile Creek and is therefore not listed in Table 3.24. Table 3.25 outlines the fifteen sub-watersheds west of the Divide having fishbearing streams. Trout species occupy approximately 140.7 miles of stream in the planning area. Other fish species found in the planning area include native mountain whitefish, longnose suckers, and sculpins.

In the Upper Missouri sub-basin side of the Divide Travel area non-native trout occupy approximately 27.7 miles (96%) of fish habitat while native WCT (90+% pure) occupy about 1.6 miles (5.5%) of available fish habitat. In the Upper Clark Fork sub-basin side of the Divide travel planning area, non-native trout occupy about 73.1 miles (65.3%) of fish-bearing habitat while native WCT (those populations 90+% pure or untested) occupy about 109.7 miles (98 %) of fish habitat. Although rare, bull trout, a native char listed as “threatened” under the Endangered Species Act, occupy about 20.9 miles (18.7%) of fish habitat in the Upper Clark Fork sub-basin side of the Divide travel planning area.

A summary of key aspects of known fish populations in the Divide Travel area is provided below under two separate tables. Table 3.24 summarizes aspects of fish populations found in the Upper Missouri sub-basin side of the planning area, and Table 3.25 summarizes aspects of fish populations for the Upper Clark Fork sub-basin side of the planning area.

Table 3.24 Current Fish Populations in Upper Missouri Sub-Basin Portion of Divide Travel Area.

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
100301011401 (Upper Tenmile Cr)	Tenmile Cr	Rb Eb	A C	7.01 11.63	
	Minnehaha Cr	Eb	C	2.77	
	Moose Cr	Eb	C	1.63	
	Ruby Cr	Eb	C	1.16	
	Monitor Cr	Eb	C	1.45	
100301011402 (Middle Tenmile Cr)	Walker Cr	Rb	C	0.29	
	Colorado G	Eb	U	0.33	
100301011403	Austin Cr	Eb	C	2.28	

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
(Greenhorn Cr)	Greenhorn Cr	Eb WCT	C R	1.90 0.54	untested
100301011404 (Skelly G)	Skelly G	WCT	U	1.07	100%
100301011502 (Upper SilverCr)	Sawmill G	WCT x Yct	C	0.03	95%
100301011801 (Iron Horse Cr)	Deadman Cr	Eb Rb	C U	1.45 0.59	
	Cottonwood G	Eb Rb WCT x Rb	C U R	1.37 1.37 1.37	<90%
	Lost Horse Cr	Eb	C	2.25	

[1] Species symbols: WCT =westslope cutthroat trout LL=brown trout Eb=eastern brook trout MWF=mountain whitefish Rb=rainbow trout Yct=Yellowstone cutthroat trout

[2] Abundance Ratings: A standardized system adopted by MDFWP to reflect peak abundance for a discrete species, expressed in number of fish per thousand feet for streams up to 20 feet wide. **A**bundant => 99 fish per 1000 ft., **U**ncommon = 4 – 19 fish per 1000 ft., **C**ommon=20 - 99 fish per 1000 ft., **R**are=< 4 fish per 1000 ft.

Table 3.25 Current Fish Populations in Upper Clark Fork Sub-Basin Portion of Divide Travel Area.

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
170102010501 (Ontario Cr)	Ontario Cr	WCT BT Eb MWF	C R U U	6.23 4.35 6.23 3.26	100%
	Mary Ann Cr	WCT	C	0.64	untested
	Ontario trib s. 27	WCT	R	0.14	untested
	Ontario trib s. 28	WCT	U	0.73	untested
	Bison Cr	WCT Eb	C C	5.12 4.42	100%

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
	Monarch Cr	WCT Eb	C U	2.91 2.42	100%
170102010502 (L.Blackfoot-Larabee)	Little Blackfoot R.	WCT BT LL EB MWF Sc	C R U C R A	11.72 11.04 9.48 11.72 9.48 10.16	100%
	No Grass Cr	WCT Eb	C C	2.44 1.03	untested
	Connors G	WCT Eb	C U	1.95 1.32	untested
	Larabee G	WCT BT Eb Sc	C R C U	3.31 0.62 2.73 0.62	untested
	Trib-A (s. 21)	WCT Eb	C U	0.80 0.80	untested
	Trib-B (s. 15)	WCT Eb	A C	0.75 0.25	untested
170102010503 (Telegraph Cr)	Telegraph Cr	WCT Eb LL SC	C C R C	4.64 4.64 0.67 0.67	100%
	Hahn Cr	WCT Eb	U U	0.63 0.63	untested
	Flume/L. Flume G	WCT Eb	C C	2.35 2.35	untested
	Jericho Cr	WCT Eb	C U	0.57 0.18	untested
	Sally Ann Cr	WCT Eb	C U	0.94 0.26	untested
	Bryan Cr	WCT	U	0.70	untested

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
		Eb	C	0.47	
	O'Keefe Cr	WCT Eb	U C	1.47 0.51	untested
	Clemmer G	WCT Eb	U U	0.73 0.41	untested
	Booth G	WCT Eb	C R	0.98 0.44	untested
	Moose G	WCT Eb	C U	0.22 0.22	untested
170102010504 (Mike Renig G)	Mike Renig G	WCT Eb	C C	4.98 4.98	100%
170102010505 (Upper Dog Cr)	Dog Cr	WCT x YCT WCT LL MWF LNS Sc	C C C U U A	7.05 1.73 7.05 7.05 7.05 7.05	91% untested
	Hope Cr	WCT LL MWF Sc	C U U C	2.03 2.03 2.03 2.03	100%
	Spring G	WCT	U	0.66	untested
	Nelson G	WCT LL	U U	0.65 0.65	untested
	Hope tributary s18	WCT LL	U R	0.32 0.32	untested
	Sawmill G	WCT	C	1.13	untested
	Meadow Cr	WCT	U	1.18	untested
	LaSalle G	WCT x YCT	C	1.26	98%
	American G	WCT	C	1.04	untested
	Bald Butte trib	WCT	U	0.39	untested

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
	Dago G	WCT	U	0.22	untested
170102010506 (Lower Dog Cr)	Uncle George Cr	WCT	U	1.93	untested
	Rich Spur Cr	WCT	C	0.19	untested
170102010507 (L.Blackfoot-Hat)	Little Blackfoot R.	WCT BT LL EB MWF Sc	C R U C R A	4.93 4.93 4.93 4.93 4.93 4.93	100%
	Slate Cr	WCT Eb	C R	2.10 1.30	untested
	Hat Cr	WCT Eb Sc	C C C	2.67 1.88 1.88	100%
170102010601 (North Trout Cr)	North Trout Cr	WCT x Rb Eb	C C	2.17 2.17	53%
	Clarks Canyon	WCT	C	1.37	untested
170102010602 (Snowshoe Cr)	Snowshoe Cr	WCT LL	C U	1.70 1.70	100%
	Spring G	WCT	U	0.10	untested
170102010603 (L.Blackfoot-Ellliston)	Elliston Cr	WCT Eb LL Sc	C C R U	3.28 1.45 1.40 1.40	100%
	Elliston tributaries	WCT	C	1.61	untested
	Hurd Cr	WCT Eb	C R	0.73 0.24	untested
170102010604 (Carpenter Cr)	Carpenter Cr	WCT	U	0.08	100%
	Ophir Cr	WCT Eb	U U	1.17 0.52	100%
	No. Fk. Ophir Cr	WCT	U	1.02	100%

6th Field HUC watershed (name)	Select Streams within HUC	Fish Species[1]	Abundance Rating[2]	Occupied Length (mi)	WCT Genetic Status
170102010605 (Trout Cr)	Trout Cr	WCT	A	4.05	100%
170102010606 (So.Fork. Dog Cr)	S. Fk. Spotted Dog	WCT Eb	U C	0.39	untested
170102010607 (Upper Dog Cr)	Spotted Dog Cr	WCT Eb	C C	2.64 1.77	100%
	N. Fk. Spotted Dog	WCT Eb	C C	1.93 0.16	untested
	M. Fk. Spotted Dog	WCT	U	0.60	untested
170102010610 (Threemile Cr)	Threemile Cr	WCT Eb	C C	0.89	100%

[1] Species symbols: WCT = westslope cutthroat trout, LL = brown trout, Eb = eastern brook trout MWF =mountain whitefish, Rb=rainbow trout, YCT=Yellowstone cutthroat trout, BT=bull trout , LNS =longnose sucker, Sc =sculpin

[2] Abundance Ratings: A standardized system adopted by MDFWP to reflect peak abundance for a discrete species, expressed in number of fish per thousand feet for streams up to 20 feet wide.

Abundant = >99 fish per 1000 ft., **U**ncommon = 4 – 19 fish per 1000 ft., **C**ommon = 20 - 99 fish per 1000 ft., **R**are =< 4 fish per 1000 ft.

Non-native fishes

Non-native fish introduced to planning area streams include rainbow trout, brook trout, brown trout and Yellowstone cutthroat trout (YCT). Brook trout, rainbow trout, and brown trout were first introduced into Montana beginning in 1889 (Brown 1971) starting with the Madison River drainage. Many subsequent stockings of these particular non-native trout continued into the larger streams of Montana by fisheries agencies and local citizens; however, stocking of brook trout and brown trout was largely discontinued in the 1950s once it was shown natural reproduction was adequate to sustain fish populations. Rainbow trout stocking in streams was later discontinued beginning in the early 1970s after it was shown hatchery raised rainbow stocked in streams containing wild rainbow trout proved counter-productive to the natural productivity of wild rainbow. However, planting hatchery rainbow into Montana lakes and ponds is still practiced in Montana to meet recreational fish management goals. The various non-native trout species do not occur in all streams or in equal proportions throughout the planning area streams. Brook trout, however, are the most pervasive of introduced fish species occupying over 88 miles (79 %) of fish habitat in the planning area.

Unknown at the time of these early introductions, non-native trout imposed inherent risks to the viability of native WCT populations that historically occupied area streams both sides of the Continental Divide (Divide) and to native bull trout populations indigenous west of the Divide. Rainbow trout and YCT hybridize with native WCT risking the loss of genetic integrity in localized WCT populations. Likewise, bull trout are subject to risk of introgressive hybridization with non-native brook trout (Kanda et al, 2002). Brown trout and brook trout interact negatively (predation and competition) with indigenous WCT that can substantially reduce or totally eliminate them altogether from their historic habitats (Likness 1984, Griffith 1988, Rieman and Apperson 1989, Fauch 1988, 1989). When brook trout and/or brown trout are present or have access to bull trout habitat, the ability of bull trout (and other native species) to survive and recover from habitat alterations can be irreversibly compromised (MBTSG 1998, pg 47). Adverse interactions from introduced fish species is a principal way in which the negative effects of habitat alteration on bull trout can be compounded (MBTSG 1998, pg 46-47; Shepard 2004).

Rainbow trout were introduced from numerous west coast hatchery stocks into virtually every suitable habitat in Montana beginning in 1889 (Brown 1971, Fredenburg and Gould 1990). In addition to hybridizing with WCT, rainbow trout compete for food, space, and cover. Within the travel planning area, this species is found in three of the 6th code watersheds east of the Divide, and west of the Divide it is found only in a private pond in the North Trout Creek sub-watershed. Evidence of rainbow hybridism in WCT populations has been confirmed in Cottonwood Gulch east of the Divide and in North Trout Creek west of the Divide. The WCT population occupying the North Fork Trout Creek west of the Divide has been confirmed having a 47% rainbow genetic contribution based on testing by Leary and Sage (1990).

Yellowstone cutthroat trout are the other cutthroat trout subspecies in Montana, and this subspecies is indigenous to the Yellowstone River basin of southeast and south central Montana including northwest Wyoming. Yellowstone cutthroat trout readily hybridize with WCT. This cutthroat subspecies has been used extensively for stocking mountain lakes in Montana (Fredenburg and Gould 1990). They are not found in any one sub-watershed of the Divide travel planning area; however, past stocking of this subspecies into the area is evident. For instance, WCT populations in Upper Silver Creek HUC east of the Divide and Upper Dog Creek HUC west of the Divide both have been confirmed genetically introgressed with YCT.

The brown trout is native to Europe and was first introduced into Montana in 1889 by the Bureau of Sport Fisheries (Brown 1971). Most varieties originated from Germany or Scotland and were distributed in most of the larger streams from state and federal hatcheries (Brown 1971, Holton 1990). Stocking was discontinued after 1956 since natural propagation was found to be adequate. Brown trout prefer larger low gradient streams and remain a threat to native westslope cutthroat trout and bull trout. This species is highly competitive in lower gradient streams and more predaceous on other fish than are rainbows or cutthroat trout (Fredenburg and Gould 1990). Brown trout prevail west of the Divide in this travel planning area especially in the main stem of the Little Blackfoot River. Other travel plan area sub-watersheds where brown trout occur include Upper Dog Creek, Telegraph Creek, Snowshoe Creek, and Ontario Creek. They are also found downstream from the forest boundary in many tributaries to the Little Blackfoot River.

Eastern brook trout were first introduced into Montana in 1889 from eastern North America, primarily from the Appalachian Mountains. It was extensively propagated and distributed throughout the state until 1954. Unlike brown trout, brook trout prefer colder, small headwater streams also preferred by most remaining native cutthroat trout populations. Brook trout

present highly predatory and competitive pressures on localized WCT and bull trout populations. Peterson and Fausch (2003) concluded that brook trout depress cutthroat trout populations at mid-elevations through age-specific biotic interactions that reduce age-0 and age-1 cutthroat trout survival, whereas WCT populations restricted to high elevations by brook trout invasion decline because an abiotic factor (very low temperatures) increases recruitment failure. Additionally brook trout spawn in the fall and are more sediment-tolerant than native cutthroat, which means brook trout have a competitive size and numerical advantage over westslope cutthroat in their first year of life. Brook trout currently occupy fifteen of the twenty-two 6th code watersheds in the analysis area

Native Species

Native fishes present within the Divide travel planning area include sensitive westslope cutthroat trout, listed "threatened" bull trout, mountain whitefish, slimy sculpin, and longnose suckers. Mapping of sculpin and whitefish populations has not been a priority and, therefore, their distribution within the planning area is not fully well-defined other than both species have been found extensively throughout the main stem Little Blackfoot River and Dog Creek. Sculpins are most abundant in cold, rocky riffle areas and because of their small size (2 to 3 inches) they are considered an important forage fish for trout. Mountain whitefish are widespread both sides of the Divide in Montana often occurring in large schools on fall spawning runs to broadcast their eggs over gravel bars. Like sculpins, small whitefish provide an important forage fish for larger trout (Fredenburg and Gould 1990, pg 24).

Native species under the category of "threatened, endangered, or sensitive" (TES) species status include westslope cutthroat trout and bull trout. In addition, an invertebrate species known as the western pearlshell mussel has also been added to the Forest Service Northern Region list of aquatic sensitive species. Further discussion about sensitive westslope cutthroat trout and listed bull trout including the western pearlshell mussel follows under separate sections addressing each species.

Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi)*

Status Overview

Westslope cutthroat trout (WCT) is one of two subspecies of cutthroat trout, which have been designated Montana's state fish. Regionally, WCT are one of several distinct interior subspecies of cutthroat trout (Behnke 1992, pgs 2-5). Currently WCT are referred to as a *Species of Concern* by the State of Montana, a *Special Status Species* by the Bureau of Land Management (BLM), and a *Sensitive Species* by the northern region of the US Forest Service. On the Helena National Forest, WCT have been identified as its fish "management indicator species". Factors associated with declines in WCT that lead up to these special categories include introductions of non-native fish, habitat loss or degradation, and over-exploitation (Hanzel 1959, Liknes and Graham 1988, Behnke 1992, McIntyre and Rieman 1995).

In May of 1997, the Fish and Wildlife Service (FWS) were petitioned to list WCT as "threatened" under the Endangered Species Act. In 2000, several environmental groups brought suit to compel the FWS to issue its final determination as to the species' listing. After the FWS determined listing WCT was "not warranted" at that time, plaintiffs filed suit claiming the FWS failed to reconcile its recognition of hybridization as a threat to WCT viability. Subsequently, the FWS initiated a new comprehensive status review for WCT in 2002 and determined, based on best scientific information available, that introgressed WCT with less than 20% of their genes derived from another taxon would still conform morphologically to the taxonomic description of

WCT. After considering evidence supporting its morphology-based approach to classifying WCT populations (including wide WCT distribution, habitat available on public lands, and state and federal conservation efforts underway), the District Court for the District of Columbia in its Memorandum Opinion concluded in March, 2007 in favor of the FWS's Reconsidered Listing Determination that WCT is not warranted for listing at this time.

The WCT status assessment by Shepard et al. (2003) estimates that of the 39% of historical habitat WCT currently occupy in Montana, the decline of the WCT subspecies is most pronounced east of the Continental Divide. East of the Divide, genetically pure WCT populations occupy less than 5% of their historical habitat (Shepard et al. 2003, pgs 87-90), and most WCT populations have been found restricted to headwater streams primarily above barriers. Consistent with findings for WCT east of the Divide, WCT populations in the Upper Missouri sub-basin side of the Divide Travel area account for only 5.5% of the fishbearing habitat. These isolated resident WCT populations (isolates) are considered extremely important to the conservation and restoration of WCT in Montana.

Management and conservation actions undertaken on behalf of WCT in Montana include: more restrictive fishing regulations; accelerated WCT surveys and inventories; non-lethal genetic testing protocols; development of captive brood stocks for stocking/recovery programs; education programs; and stepped-up compliance with water and habitat protection laws, policies and guidelines; non-native species removals; and habitat improvement. These efforts culminated in a formalized Montana *MOU and Conservation Agreement for WCT* (MDFWP 1999) co-signed by nine government agencies and conservation groups including the Forest Service and Bureau of Land Management. That initial MOU/conservation agreement was a five-year agreement, which expired in 2005, and has been superseded by the 2007 MOU/Conservation Agreement (MDFWP 2007) to expedite conservation measures for westslope cutthroat trout *and* Yellowstone cutthroat trout throughout their respective historical ranges in Montana.

One outcome of the latest WCT status review and MOU/Conservation Agreement is the designation of three categories of cutthroat trout populations:

- *Core populations* – Cutthroat populations having no evidence of hybridization (i.e. genetically pure) that can serve as donors for restoration efforts.
- *Conservation populations* – Populations that include all the "core" populations as described above *plus* those that have unique ecological and behavioral traits of the subspecies. Introgressed conservation populations will typically be less than 10% introgressed.
- *Sportfish populations* – Wild or hatchery-sustained cutthroat populations that are managed especially for the benefit of recreational fisheries. Some wild sportfish populations may have conservation value.

All *conservation* populations of WCT merit additional management emphasis on preserving them (Shepard et al. 2003 pg 8). Conservation coordination focuses on *species* management with the Montana FWP as the lead agency, and *habitat* management on NFS/BLM administered lands with land management agencies taking lead responsibility. Regional/sub-basin scale conservation plans developed by FWP in cooperation with land management agencies will identify management needs of WCT conservation populations required to accomplish the conservation and restoration objectives outlined in the 2007 WCT MOU/Conservation Agreement across each 4th field HUC or sub-basin.

Distribution

On the Helena National Forest WCT are found in the Blackfoot River, Little Blackfoot River portion of the Upper Clark Fork River, Upper Missouri River, Dearborn River, Smith River, and Boulder River 4th field HUCs. Distribution of westslope cutthroat trout within these 4th code hydrologic units extends into a number of streams on the Helena National Forest with many more streams supporting WCT west of the Continental divide than east of the Divide. Only one stream on the Helena Forest in the Boulder drainage supports WCT. Although the Dearborn River supports WCT in its headwaters on the Lewis and Clark Forest, there are no known WCT on Helena Forest streams within the Dearborn 4th field HUC. The WCT distribution information is detailed on 4th field hydrologic unit maps available at the Helena Forest Supervisors Office Fishery Files and the Montana Department of Fish, Wildlife, and Parks Helena office. Many of the streams on the Helena Forest that support WCT are small with many young-of-the-year and yearling WCT found in Helena Forest streams less than 18 inches in width.

For the Divide travel planning area, WCT are distributed both sides of the Continental Divide. The subspecies is well distributed throughout the Little Blackfoot River and its tributaries of the travel planning area accounting for up to 98% of occupied fish habitat. Conversely, WCT are poorly distributed east of the Divide within the travel planning area accounting for only about 5.5% of occupied fish habitat.

General Life History Characteristics

Detailed information on Life History, Habitat Relations, and biotic interactions for WCT is discussed in depth in McIntyre and Rieman (1995 pages 1-6), Behnke (1992 pgs 77-87), and Liknes and Graham (1988 pgs 53-59) and is summarized below. Additional citations are included if information varies from what is described by these authors.

WCT are adfluvial, fluvial, or resident. All three forms may use the same river and stream system. They begin to mature at age 3 but usually spawn first at age 4 or 5. They spawn between March and July at water temperatures near 50º F. The ratio of females to males has been found to vary from 1:1 up to 6:1. Alternate year spawning has been documented and repeat spawning also occurs, but generally spawning more than twice during an individual WCT lifespan does not occur. Mortality following spawning has ranged from 27% to 60% with mortality rates slightly higher for males than for females.

WCT are generally thought to spawn in small tributaries. The headwaters and upper reaches of large river basins tend to be dominated by fluvial and resident forms while tributaries to lakes primarily support adfluvial fish. Migratory forms may spawn in the lower reaches of tributaries used by resident WCT. Body size influences the nature of habitat selected for spawning.

Fry generally emerge from gravels between mid-June and mid-July, although emergence extending into August has been documented (Averitt and MacPhee 1971). Fry emerge following yolk absorption at a length of about 20mm. After emergence many fry disperse downstream. Peaks in downstream movements of fry generally coincide with peaks in stream discharge. After an initial exodus of fry, the offspring of migratory forms may remain 1-4 years in their natal stream. Most juvenile migrants leave tributaries in spring or early summer and most movement is at night.

Adult and sub-adult fluvial WCT often make long seasonal migrations. This type of migration is characterized by downstream movements in the fall followed by upstream movements in the spring. Downstream movement is presumably related to find areas of suitable winter habitat.

Little or no winter movement was found in systems with an abundance of high quality pools that could be used for winter habitat.

Habitat Relations

Waters inhabited by WCT generally are cold and nutrient poor. Growth varies widely, but is probably strongly influenced by habitat productivity. Generally growth is higher for migrant forms that spend some period of time in larger rivers (fluvial) or lakes (adfluvial). Although WCT can be found throughout large river basins spawning and early rearing generally occurs in headwater streams. Spawning habitat has been characterized as gravel substrates ranging in size from 2mm to 75mm, mean water depths ranging from 17cm to 20cm, and mean velocities of 0.3 to 0.4 m/sec.

Substrate composition is believed to strongly influence survival. Highly embedded substrates may be particularly harmful to juveniles that typically over-winter between spaces in stream cobbles and rubble. Evidence for the negative influence of fine sediment is widespread and, in general, increased sediment in substrates must be viewed as an increased risk for any WCT population.

Westslope cutthroat trout micro-habitats are associated with velocities ranging 0.1 to 0.3 m/s. WCT less than 100mm in length are generally found in pools and runs while larger cutthroat trout are found in pools. Generally stream reaches with numerous pools support the highest densities of fish. Habitats that provide some form of cover also seem to be preferred. In winter small fish tend to use areas where cover is provided by the interstitial spaces in the stream substrates. Larger fish congregate in pools during the winter.

Biotic Interactions

Westslope cutthroat trout co-evolved with mountain and pygmy whitefish, several sculpins, cyprinids (minnows), and catastomids (suckers). In Columbia River tributaries the WCT is most commonly associated with bull trout, resident and anadromous rainbow trout or steelhead, and chinook salmon.

Where bull trout and WCT overlap in distribution the species have selectively segregated their use of habitat and prey with WCT focusing on a diet primarily of invertebrates.

Where introductions of non-native rainbow trout have occurred the two species tend to segregate themselves with rainbow in downstream reaches and WCT in the upper reaches. However, segregation is incomplete and hybridization is common. Yellowstone cutthroat trout were commonly used as a stocking source, especially for mountain lakes and some larger rivers; therefore, hybridization between Yellowstone cutthroat trout and westslope cutthroat trout is also common.

Brook trout have replaced cutthroat trout populations, including the WCT subspecies, in many streams (Peterson and Fausch 2003b) and several authors have discussed the possible mechanisms by which this occurs (Peterson et al 2004, Shepard 2004, De Staso and Rahel 1994). There is some evidence that water temperatures and increased water velocities associated with higher stream gradients are important factors (De Staso and Rahel 1994). In addition to temperature and stream gradient Peterson et al (2004) suggested that a very important factor in the interspecific species population dynamics between brook trout and cutthroat species may be the interaction of brook trout with age classes 1 and 2 of cutthroat trout. When there is much overlap of brook trout with the young age classes of WCT, Peterson et al (2004) found that WCT did not compete well. Upstream movements by brook trout during spring runoff and a

general tendency to move upstream are possibly factors allowing adult and sub-adult brook trout to extend their upstream distributions into habitats occupied by cutthroat trout (Peterson and Fausch, 2003a). Shepard (2004) discusses past literature in relation to his findings and suggests that a number of factors or combination of factors such as pools, increased woody debris, increased fine sediment levels, and increased water temperatures may facilitate brook trout invasion.

Bull Trout (Salvelinus confluentus)

On July 10, 1998 bull trout were listed as a "Threatened Species" within the Columbia River Basin by the United States Fish and Wildlife Service (USFWS). Section 7(a) (2) of the Endangered Species Act (ESA) of 1973 as amended requires all federal agencies to review actions authorized, funded, or carried out by them to ensure such actions do not jeopardize the continued existence of listed species.

Under INFISH (USDA 1995) priority drainages for bull trout were established. On the Helena Forest priority drainages include Copper Creek/Landers Fork in the Blackfoot drainage and the Little Blackfoot River drainage upstream of the confluence of Dog Creek in the Upper Clark Fork sub-basin. Besides priority drainages, a secondary tier of bull trout "Special Emphasis Watersheds" were established as a means of identifying a refugia network of streams that would assist in the protection and recovery of bull trout as specified under *Additional Agency Commitments* in the 1998 Biological Opinion for continued Land and Resource Management Plans (USDI 1998 page 24). On the Helena Forest "special emphasis watersheds" include Arrastra Creek, Beaver Creek, Moose Creek, Willow Creek, Poorman Creek, Hogum Creek, Alice Creek, and upper Nevada Creek in the Blackfoot drainage. In the Little Blackfoot drainage upper and lower Dog Creek was added as a Special Emphasis Watershed.

In the 2010 Final Rule on Bull Trout Critical Habitat, the U.S. Fish and Wildlife Service did not classify the Little Blackfoot River or any of its tributaries as bull trout critical habitat.

The distribution of bull trout on the Helena National Forest is limited to drainages west of the Continental Divide with the strongest populations present in the Blackfoot River drainage. Bull trout occur in extremely low numbers within the Little Blackfoot River drainage. Table 3.25 above shows the 6th field HUCs with the streams known to support bull trout. The table shows that bull trout have been documented on forest in the main stem Little Blackfoot River, Ontario Creek, and lower Larabee Gulch. Although not shown in Table 3.25, bull trout have also been documented in lower Dog Creek on private reaches below the Divide travel planning area.

The Draft Bull Trout Recovery Plan completed in 2005 has not yet been finalized as well as the Forest Service's Draft Bull Trout Conservation Strategy. Under the Draft Bull Trout Recovery Plan bull trout within various drainages are organized by "core populations" with local populations included within those core populations. The following section discusses the core and local populations pertinent to this travel planning area. Much of the information was based on local biologists' knowledge and familiarity with local conditions.

Upper Clark Fork River Section 1 Bull Trout Core Population (Upstream of Milltown Dam site)

As per the Bull Trout Recovery Plan, the "Upper Clark Fork Section 1 Core Area" includes five (5) local bull trout populations. One of the local bull trout populations is in the Little Blackfoot River, which is included in this travel planning area. The Little Blackfoot River is included in the Upper Clark Fork Section 1 Bull Trout Core Population Area as part of the Bull Trout Draft

Recovery Plan. The other local bull trout populations are Warm Springs Creek, Racetrack Creek, Flint and Boulder Creek, and Harvey Creek.

Adult bull trout are present in low numbers for all five of the local populations. For some local bull trout populations such as the Little Blackfoot local population, adults are estimated to be less than 50, which is considered extremely low. The number of adult bull trout in the overall core population area is likely between 50 and 500.

Brook trout and brown trout are present in some of the local populations and likely exert both competitive and predation forces on bull trout. Hybridization with brook trout appears to be a common problem where isolated or remnant bull trout populations overlap with brook trout (Rieman and McIntyre 1993, pg 4). Consequently, it is unlikely that the bull trout core population will improve within the next 5 to 10 years.

The five local populations are currently not functioning as a connected fluvial population. It is possible that a few individual bull trout from the various local populations migrate downstream to the Upper Clark Fork River or to lower reaches of streams within a given local population, but have escaped detection. Hence, there is some possibility for a remnant fluvial population.

Based on overall population size of fewer than 500 adults, the risk of extinction for bull trout would be considered "moderate" under a relative risk assessment in Rieman et al (1993) for the entire Upper Clark Fork Section 1 Core Area. Within the Little Blackfoot Local Bull Trout Population the extinction risk would be rated as "high" taking into consideration the low number of adults (<50) believed to be present and the presence of non-native brook trout and brown trout.

General Habitat Requirements for Bull Trout

The following discussion of bull trout habitat requirements in Montana is taken from MBTSG (Montana Bull Trout Scientific Group) 1998. The majority of migratory bull trout spawning in Montana occurs in a small percentage of the total stream habitat available. Spawning occurs between late August and early November, principally in third and fourth order streams. Spawning adults use low gradient areas (< 2%) of gravel/cobble substrate with water depths between 0.1 and 0.6 m and velocities from 0.1 to 0.6 m/s. Proximity of cover for the adult fish before and during spawning is an important habitat component. Spawning tends to be concentrated in reaches influenced by groundwater where temperature and flow conditions tend to be more stable. The relationship between groundwater exchange and migratory bull trout spawning requires more investigation. Spawning habitat requirements of resident bull trout are poorly documented.

Successful incubation of bull trout embryos requires water temperatures below 8°C, spawning gravels with less than 35-40% of sediments smaller than 6.35 mm in diameter, and high gravel permeability. Eggs are deposited as deep as 25.0 cm below the streambed surface and the incubation period varies depending on water temperature. Spawning adults alter streambed characteristics during redd construction to improve survival of embryos, but conditions in redds often degrade during the incubation period. Mortality of eggs or fry can be caused by scouring during high flows, freezing during low flows, superimposition of redds, or deposition of fine sediments or organic materials during the incubation period. A substantive inverse relationship exists between the percentage of fine sediment in the incubation environment and bull trout survival to emergence. Embryo/fry entombment appeared to be the largest mortality factor in incubation studies in the Flathead drainage. Groundwater influence plays a large role in embryo development and survival by mitigating mortality factors.

Rearing habitat requirements for juvenile bull trout include cold summer water temperatures (15°C) provided by sufficient surface and groundwater flows. Warmer temperatures are associated with lower bull trout densities and can increase the risk of invasion by non-native species that could displace, compete with, or prey on juvenile bull trout. Juvenile bull trout are generally benthic foragers rarely straying from cover, and they prefer complex forms of cover. High sediment levels and embeddedness can result in decreased rearing densities. Unembedded cobble/rubble substrate is preferred for cover and feeding and also provides for higher invertebrate production. Highly variable streamflow, reduced large woody debris, increased bedload movement, and other forms of channel instability can limit the distribution and abundance of juvenile bull trout. Habitat characteristics that are important for juvenile bull trout of migratory (fluvial) populations are also important for stream resident sub-adults and adults. However, stream resident adults are more strongly associated with deep pool habitats than are migratory juveniles.

Both migratory and stream-resident bull trout move in response to developmental and seasonal habitat requirements. Migratory individuals can move great distances (up to 250 km) among lakes, rivers, and tributary streams in response to spawning, rearing, and adult habitat needs. Stream-resident bull trout migrate within tributary stream networks for spawning purposes, as well as in response to changes in seasonal habitat requirements and conditions. Open migratory corridors, both within and among tributary streams, larger rivers, and lake systems are critical for maintaining bull trout populations.

Western Pearlshell Mussel (*Margaritifera falcata)*

After completion of the Montana Comprehensive Fish & Wildlife Conservation Strategy (CFWCS) for native species management in 2005 (MFWP 2005), it was apparent basic scientific information about the state's invertebrate species was lacking and that more comprehensive treatment specific to the state's mussels was needed. The Western pearlshell mussel had been listed as a potential species of concern in 2004 and later became a Tier I invertebrate species of greatest conservation need after completion of the 2005 Montana CFWCS. Subsequently, the Montana Natural Heritage Program launched a comprehensive survey plan in 2007 to determine the distribution and population viability of all three mussel species native to Montana, including the western pearlshell mussel. A report documenting populations of these freshwater mussels was completed in 2010 by Stagliano (2010). Information in this segment is based primarily on findings from Stagliano (2010) including information online from the Montana Natural Heritage Program site and the 2005 CFWCS.

Western Pearlshell mussels are one of five freshwater mussels of the family Margaritiferidae in North America. Their range is reported in Pacific drainages from California to southern Alaska. In Montana, the western pearlshell is the only freshwater mussel found in coldwater trout streams west of the Continental Divide and east of the Divide in headwater streams of the Missouri River basin (MFWP 2005).

This mussel species appears to have crossed the Continental Divide from west to east in Montana with its host fish, the westslope cutthroat trout, when the upper Missouri River flowed south to the Snake River (Gangloff and Gustafson 2000, cited by Stagliano 2010). As glochidia (larvae on the fish gills), they use their fish host (generally salmonids) for upstream/downstream dispersal into suitable habitats. Adult pearlshel mussels are sedentary. Western pearlshell mussel habitat consists of cool-cold running low gradient (1-2%) streams, typically those of Rosgen type C4 morphology, and the species prefers coarse sand and gravel substrates

stabilized by cobbles and boulders that shelter mussel beds from substantial bed scour during high flows from floods and storm events.

The western pearlshell mussel was added to Montana's Species of Concern (S2) list in 2008 due to declining and/or very limited numbers, range, and/or habitat, making it vulnerable to extirpation in Montana. Mussel beds previously reported in larger rivers (Blackfoot, Big Hole, Clark Fork River) are extirpated or at such low densities that long-term viability is questionable. Surrounding states listed it as state-threatened or unranked, and declining in Wyoming, Idaho, and Oregon (NatureServe 2005, online at http://www.natureserve.org/explorer). In Utah the species appears to have been extirpated.

Threats to western pearlshell mussel populations include extensive damming, diversions, hydroelectric, and other water supply projects that have substantially reduced the range of this species. Agricultural runoff (eutrophication), unstable substrate, and siltation have also been cited as major problems to the species (Western Pearlshell – MT Field Guide, online at http://fieldguide.mt.gov/detail_IMBIV27020.aspx). These ongoing disruptions of western pearlshell habitats together with the most recent delineation of the species viability in Montana (Stagliano 2010) has lead to it being added to the Sensitive Species list by USFS Northern Region (R1).

Systematic surveys in 2007-2009 by Stagliano (2010) showed the western pearlshell mussel is widespread in western Montana, but viability is threatened. Presently, only 14 western pearlshell populations from eight streams were ranked excellent (A-viability) statewide using ranks of occurrences online at http://www.natureserve.org/explorer/keyforgenericranking.pdf and described in Hammerson et al. (2008). Site revisits at 40 originally reported occurrences of pearlshell mussel found 25 ocurrences not viable or extinct. Of the six mussel species reported to occur in Montana (three native and three introduced), western pearlshell mussel had the highest percentage of negative mussel searches (no live individuals) at 81.2% or an 18.8% detection probability (Stagliano 2010, pg 21).

Of 70 occurrence records for western pearlshell mussel so far documented east of the Continental Divide in Montana (Stagliano 2010) only seven (10%) populations ranked excellent or good viability (A, B viability). Thirty-two (46%) other known western pearlshell populations east of the Divide ranked not viable (D viability) and five populations are now extinct. Of the remaining known eastside populations, all ranked fair (C viability) in that persistence is considered uncertain under current conditions.

For areas in and around the Helena National Forest, the latest surveys by Stagliano (2010) found six of western pearlshell mussel occurrences in the Blackfoot drainage; four in the Smith River; three in the Boulder River; and one each in Deep Creek and Dry Creek of the Big Belts range. According to Stagliano's surveys (2010) sampling for western pearlshell mussel in the Little Blackfoot River and major streams draining the east flank of the Divide Travel area failed to find any occurrences of pearlshell mussel. There are no documented occurrences of western pearlshell in the Divide travel planning area. However, based on habitats where the species have been found throughout their range, a map provided by Stagliano (Appendix A) shows current predicted western pearlshell reaches closest to the Divide travel planning area. The map shows no predicted pearlshell mussel habitat in the planning area west of the Divide, but predicted western pearlshell mussel reaches may exist in the planning area east of the Divide in the lower reach of Tenmile Creek where it exits the Helena National Forest.

Fish Habitat

Background

Trout habitat in the travel planning area is essentially the product of interactions among underlying geologies, soils, topography, vegetation, climate and hydrology unique to the area's watersheds (Meehan 1991, pg 5; Swanston 1991, pg 139). These drainage characteristics and processes remain fairly constant setting up conditions for optimum production of aquatic lifeforms (Meehan 1991, pg 5). When natural disturbance reshapes stream channels, the actual effects on aquatic organisms are often short-lived. In their natural context, accessory processes like fire, flood flows, insect infestations, disease, windthrow, and animal activities (e.g. beaver) operate on the stream system to produce improved habitat quality and productivity in the long term (Swanston 1991, pgs 139-142).

Human land-use activities can disrupt the delicate balance of these interactions producing persistent changes in habitat that can reduce natural fish production and population viability (Meehan 1991, pgs 1-6; Waters 1995, pgs 1,17). The Divide travel planning area traditionally has been managed for non-fishery resources. These include timber harvest, mining, livestock grazing, forest transportation and recreation. Other human activities that affected fish habitat included beaver removal, irrigation withdrawals, development activities on private inholdings, and utility corridors.

Cumulatively, these activities impair natural stream functions to varying degrees in the analysis area by accelerating erosion and sedimentation, altering surface flows, reducing vegetation cover, and destabilizing or degrading stream channels. In general, any ground disturbing activity has potential to increase erosion and exacerbate excess sediment delivery within a watershed, in turn lowering the natural fish production capabilities (carrying capacity) of streams (Hicks et al. 1991). Hence, excessive sediment delivery that persists beyond natural background levels becomes the common denominator of various land-use activities affecting fish habitat (Meehan 1991). A list of activities, both past and ongoing, occurring within the travel planning area is shown in Appendix B.

Forest roads have been tagged as producing the majority of excess sediment amongst forest activities and management practices (Anderson 1971, Anderson et al. 1976, Cederholm et al. 1981, Furniss et al. 1991, Waters 1995) followed by past mining disturbance and streambank destabilization/degradation in active grazing allotments. The degree to which road construction/maintenance has on altering sediment production in a watershed varies substantially and is not possible to quantify accurately. In general, the magnitude and risk for sediment delivery from roads, including other land use activities, is a function of the amount of surface disturbance (acres disturbed) and proximity to streams within a given sub-watershed. The specific effects on trout and trout habitat from excessive erosion and sedimentation are discussed in more detail under the Environmental Consequences section.

The road-fisheries relationship extends beyond the risk of chronic excess sedimentation. A second risk element is road proximity to streams. When roads are constructed adjacent to a stream they constrain the channel resulting in a stream limited in its ability to access its historic floodplain and often result in the removal of riparian vegetation to accommodate the road right-of-way. Such roads change the physical attributes of trout habitat by reducing pools, meanders, undercut banks, streamside vegetation/shading, large woody debris recruitment, and result in higher energy gradients all rendering the stream less productive for fisheries. An example in the

Divide travel planning area is 0.35 miles of Forest Road #227 in the Hat Creek area that parallels the Little Blackfoot River.

Stream crossings represent a third road risk factor to fish habitat and fish populations. Roads that cross streams most frequently rely on culverts instead of bridges that often disrupt upstream fish migration. This limits a fish population's access to habitat types needed to fulfill their life stage requirements for spawning, rearing, feeding, over-wintering, security and escapement. Additionally, stream crossings, particularly culverts, can result in chronic sedimentation impacts during typical water years and catastrophic effects when floods trigger crossing failure (USDA –FS 1998, pg 2). Ford crossings, especially unimproved fords, directly alter the bed and banks of fish habitat and act as chronic sources of sediment. Ford crossings located in or near spawning and nursery areas are particularly risky to sensitive incubating salmonid embryos and fry due to direct vehicular disturbance to the streambed and banks, and traffic generally causes the streambanks to widen as the banks break down and wash away (Clarkin et al 2006. pg 5-1).

Road-stream intersections can also influence the probability for increased opportunities of concentrated recreational use alongside stream courses imposing increased effects on fish habitat (Clark and Gibbons 1991, pg 476). An example of this is the complex of user-created dispersed sites situated along the banks of the Little Blackfoot River associated with two ford crossings: one on Forest Route # 4100 that accesses Negro Mountain from the west and another ford on a user-create route off of Forest Route # 123 (Ontario Creek road).

Integrating the three risk factors of roads into this analysis relies on two important indicators or measures to evaluate: *stream-road intersections* and *roads within 300 feet of streams (high risk roads).* Together they serve to help quantify these important interactions of the road-fisheries relationship and respond most predictably and reliably to the action alternatives as a barometer of change. However, it is important to point out that not all stream-road intersections and high risk roads have the same effect in terms of the magnitude and risk to salmonid habitat. For instance crossings in prime bull trout or WCT habitat present far greater risks to these populations than do crossings located in areas much more isolated from occupied fish habitat. Therefore, a more detailed discussion is included that addresses those crucial crossing sites where stream habitat and the trout that depend on those areas are at substantially higher risk than from other crossings.

Other aquatic habitat criteria are not considered in detail in this travel plan as the decision would not affect them. More discussion about fish habitat conditions in various subwatershed units west of the Continental Divide in the analysis area is available in watershed baselines for the Little Blackfoot River portion of the Upper Clark bull trout Section 7 Watershed (USDA 2000) including updates to the U.S. Fish and Wildlife Service.

Measures to Evaluate the Stream-Road Relationship

Stream-road intersections are points where roads intersect with streams and relate specifically to road-stream crossings (culverts, bridges, and fords). These measurements aid in assessing the environmental risk of flow restrictions or fish migration barriers at culverts, hydrologic connectivity/sedimentation, and alterations in channel morphology that result from stream crossings. Bridges impact fish habitat the least of the three common types of stream crossings.

High risk roads (within 300 feet of a stream) is a measure that attempts to address the environmental issue of road-stream proximity as it relates to excessive sediment delivery risk

and stream physical alteration. Essentially, this element provides a measure of the hydrologic connectivity between roads and streams. A hydrologically connected road is defined as any road segment having a continuous surface flow path to a stream channel. Wherever any hydrologic connection exists, excessive fine sediment and road-associated chemicals (oils, dust abatement, spill) are provided an efficient route directly into the natural surface water system. Furthermore, roads within 300 feet either side of streams have been found to be of high risk for non-channelized sediment inputs to surface waters because of insufficient buffer widths that serve to filter out sediment from gaining access to streams (Belt et al. 1992).

During the 2002 Forestwide Roads Analysis project, fisheries personnel produced a guide to help rate the risk of a particular road or road segment on aquatic resources within the context of 6th field HUCs or sub-watershed units. A product of that roads analysis was a fish risk rating for roads that assigned a road one of three separate risk categories: "high", "moderate" and "low risk".

Generally, "high risk" roads were those associated with high value fisheries (recreational or listed/sensitive species) and commonly included stretches over 0.5 miles long with 2+ road crossings, or were within the stream corridor and had 1+ road crossings (culverts, fords, bridges). "Moderate risk" roads were those that posed the same problems as high risk roads except they generally involved stretches less than 0.5 mile in the stream corridor with one or no crossings. They also exhibited qualities similar to high risk roads except they occurred in watersheds that lacked high value fisheries. "Low risk roads" represent little or no problems to the stream system since they typically occur over upland terrain outside stream corridors such as along ridge lines where there is no perennial or intermittent surface connection to the stream system. Therefore, low risk roads are not considered in the fisheries analysis. More information about the rationale used at deriving these risk ratings for roads can be found in the project file.

Because the two measures to evaluate (*stream-road intersections* and high risk *roads within 300 feet of streams*) used in this analysis integrate the same environmental risks implied in the fisheries risk rating system discussed above, they serve as an excellent surrogate for the concept of "high" and "moderate" risk roads commonly relied upon to rate the road-fisheries relationship under the 2002 Forest Road Analyses project. For this analysis roads within 300 feet of streams will be referred to as "high risk roads" and encompass both high and moderate risk roads under the 2002 Forestwide Roads Analysis Project.

An overview of existing conditions in each 6th field NRCS HUC relative to the measures used in this analysis is provided in Tables 3.26 and 3.27 below. They numerically separate out the amount of *stream-road intersections* and miles of *high risk road within 300 feet of streams* respectively for each individual 6th field HUC in the Divide travel planning area.

Table 3.26 Stream-Route Intersections per 6th field NRCS watershed in Divide Travel Planning Area.

6th Field HUC sub-watershed (name)	**Forest Service (FS) stream-road intersections**			**Non- FS Total**
	Open road	**Closed road**	**Total**	
Upper Missouri Sub-basin watersheds				
100301011401 (Upper Tenmile Cr)	20	10	30	22

6th Field HUC sub-watershed (name)	Forest Service (FS) stream-road intersections			Non- FS Total
	Open road	Closed road	Total	
100301011402 (Middle Tenmile Cr)	18	7	25	3
100301011406 (Lower Tenmile Cr)	4	0	4	0
100301011403 (Greenhorn Cr)	13	0	13	25
100301011404 (Skelly G)	2	0	2	0
100301011502 (Upper Silver Cr)	2	0	2	0
100301011801 (Iron Horse Cr)	7	1	8	4
Sub-total:	66	18	84	54
Upper Clark Fork Sub-basin watersheds				
170102010501 (Ontario Cr)	10	8	18	0
170102010502 (L.Blackfoot-Larabee)	4	14	18	1
170102010503 (Telegraph Cr)	29	19	48	7
170102010504 (Mike Renig G)	0	5	5	1
170102010505 (Upper Dog Cr)	39	2	41	20
170102010506 (Lower Dog Cr)	4	0	4	1
170102010507 (L.Blackfoot-Hat)	8	6	14	4
170102010601 (North Trout Cr)	10	0	10	1
170102010602 (Snowshoe Cr)	10	4	14	0

6th Field HUC sub-watershed (name)	Forest Service (FS) stream-road intersections			Non- FS Total
	Open road	Closed road	Total	
170102010603 (L.Blackfoot-Ellliston)	3	3	6	1
170102010604 (Carpenter Cr)	5	11	16	0
170102010605 (Trout Cr)	1	0	1	0
170102010606 (So.Fork. Dog Cr)	1	1	2	0
170102010607 (Upper Dog Cr)	4	2	6	0
170102010610 (Threemile Cr)	0	1	1	0
Sub-total:	128	76	204	36
Grand Total:	194	94	288	90

In summary, 24% (90) of the 378 total stream crossings in the Divide Travel area are not under Forest Service jurisdiction. They are considered an ongoing cumulative effect to aquatics in the planning area. Forest Service roads account for 288 crossings, and 33% (94) of them are currently closed to wheeled motorized use. On the Upper Missouri sub-basin side of the project, Upper Tenmile Creek has the highest incidence of FS stream-road intersections with 30. On the Upper Clark Fork side, Telegraph Creek has the highest incidence of stream-road intersections with 48, but Upper Dog Creek (north of Highway 12) has the highest number of crossings open to wheeled motorized traffic with 39. Four crossings are fords in bull trout occupied habitat, which include two fords on Ontario Creek and two on the Little Blackfoot River.

Table 3.27 High Risk Roads (within 300 ft of streams) by 6th field NRCS watershed in Divide Travel Area.

6th Field HUC sub-watershed (name)	Forest Service (FS) high risk roads (miles)			Non-FS Total (miles)
	Open road	Closed road	Total	
Upper Missouri Sub-basin watersheds				
100301011401 (Upper Tenmile Cr)	4.35	1.72	6.07	6.06
100301011402	2.35	0.65	3.00	0.45

6th Field HUC sub-watershed (name)	Forest Service (FS) high risk roads (miles)			Non-FS Total (miles)
	Open road	Closed road	Total	
(Middle Tenmile Cr)				
100301011406 (Lower Tenmile Cr)	0.85	0	0.85	0
100301011403 (Greenhorn Cr)	3.55	0.15	3.7	4.40
100301011404 (Skelly G)	0.95	0.07	1.02	0
100301011502 (Upper Silver Cr)	0.60	0	0.60	0
100301011801 (Iron Horse Cr)	1.41	0.51	1.92	1.08
Sub-total:	14.06	3.10	17.16	11.99
Upper Clark Fork Sub-basin watersheds				
170102010501 (Ontario Cr)	1.64	0.84	2.48	0
170102010502 (L.Blackfoot-Larabee)	1.84	2.34	4.18	0.16
170102010503 (Telegraph Cr)	5.03	3.06	8.09	0.91
170102010504 (Mike Renig G)	0	1.75	1.75	0.08
170102010505 (Upper Dog Cr)	6.73	0.27	7.00	5.04
170102010506 (Lower Dog Cr)	0.84	0	0.84	0.13
170102010507 (L.Blackfoot-Hat)	1.85	1.25	3.10	0.65
170102010601 (North Trout Cr)	2.98	0	2.98	0.49
170102010602 (Snowshoe Cr)	3.76	0.75	4.51	0

6th Field HUC sub-watershed (name)	Forest Service (FS) high risk roads (miles)			Non-FS Total (miles)
	Open road	Closed road	Total	
170102010603 (L.Blackfoot-Ellliston)	0.74	0.73	1.47	0.28
170102010604 (Carpenter Cr)	0.79	2.90	3.69	0
170102010605 (Trout Cr)	0.09	0	0.09	0
170102010606 (So.Fork. Dog Cr)	0.12	0.08	0.2	0
170102010607 (Upper Dog Cr)	0.85	0.15	1.00	0
170102010610 (Threemile Cr)	0	0.10	0.1	0
Sub-total:	27.26	14.22	41.48	7.74
Grand Total:	41.32	17.32	58.64	19.73

There are approximately 719 total miles of roads, including both FS and non-FS roads, within the Divide planning area. About 78.4 miles (10.9%) of the road system are considered high risk roads to streams, and 25% (19.73 miles) of them are not under Forest Service jurisdiction. The high risk FS roads total up to about 58.64 miles of all high risk roads, and 30% (17.32 miles) of them are currently closed to wheeled motorized traffic. Another way of looking at it is FS high risk roads account for 75% (58.64 miles) of all high risk roads in the planning area, and 41.32 miles are currently open to wheeled motorized use. On the Upper Missouri sub-basin side of the planning area the Upper Tenmile Creek drainage has the most miles of FS high risk *roads* with 6.07 miles. On the Upper Clark Fork side, the Telegraph Creek drainage has the highest miles of FS *high risk* roads with about 8.09 miles.

Other (secondary) measures to evaluate associated with roads:

Dispersed recreational sites

Dispersed recreational sites associated with the transportation system can impact fish habitat ranging from minor where use is infrequent or substantial when use is more concentrated such as along trails or popular campsites (Clark and Gibbons 1991, pg 475). The Little Blackfoot River corridor is a popular recreational zone (Kurt Cuneo, pers comm. 5/14/2009) based on observations by Forest recreation and resource staff over the past 20 years. To note, most campsites have been found occupied or full on weekends, especially holidays and variably during the hunting season. At least 75-80% of campsites along the Little Blackfoot River and its main tributaries, Ontario Creek and Telegraph Creek, were observed as occupied especially over weekends during onsite visits by Forest recreation staff (Dave Payne, pers. comm. 5/14/2009).

In 2004, the Helena Ranger District conducted a comprehensive inventory of dispersed recreational campsites within four sub-watersheds of the Little Blackfoot River drainage south of Highway 12. The purpose for the survey was to collect information for planning about the extent and magnitude of dispersed campsites associated with FSR 227 and 4100 (Little Blackfoot River), FSR 123 and 4104 (Ontario Creek), FSR 4104 and 1801 (Monarch Creek), and FSR 495 (Telegraph Creek).

Additionally, this inventory was used to help determine both the specific locations and degree of riparian impacts caused from dispersed recreational sites associated with high risk roads within the INFISH buffer (300 feet of inland native fish habitat) by assessing which campsites were contributing sediment and retarding Riparian Management Objectives or both under the INFISH amended Forest Plan. Findings from that inventory show there are at least 46 dispersed recreational sites associated with stream corridor roads and ford crossings within the four 6th field HUC watersheds as displayed in Table 3.28 below. Nine dispersed campsites were documented retarding the attainment of Riparian Management Objectives or continue risking adverse effects to listed bull trout because of observed bank erosion, sediment delivery, and lost vegetation ground cover or bare mineral soil within 0-100 feet from surface water.

Table 3.28 Inventory summary of dispersed campsites associated with high risk roads within four sub-watersheds in Divide travel planning area.

6th Field HUC sub-watershed (name)	**Number dispersed recreation camps on NFS land**	**Number FS dispersed campsites that retard attainment of RMOs[1]**	**Observed impacts on fish habitat at sites that retard attainment of RMOs**
170102010501 (Ontario Cr)	13	1	Bank disturbance; soil compaction; erosion; loss of ground cover adjacent to stream.
170102010502 (L.Blackfoot- Larabee G)	17	5	Bank disturbance; soil compaction erosion; increased sedimentation; removal of riparian understory.
170102010503 (Telegraph Cr)	7	0	
170102010507 (L.Blackfoot- Hat Cr)	9	3	Bank disturbance; soil compaction; erosion; increased sedimentation; removal of riparian understory; wading pools.
Total:	46	9	

[1] RMO is an acronym for Riparian Management Objectives used to describe six environmental features as habitat indicators of ecosystem health for inland native fish under INFISH. The term "retard" under INFISH means to slow the rate of recovery below the near natural rate of recovery if no additional human caused disturbance was placed on the system.

High Risk Fords for Special Consideration to Threatened, Endangered, Sensitive (TES) Fish Habitat

There are two fords directly located on the Little Blackfoot River and two fords on Ontario Creek all in occupied bull trout habitat. Three fords are of special concern to fisheries management because they are open to wheeled motorized use, which risk ongoing fish habitat disturbance and direct mortality to listed bull trout and sensitive WCT. The largest open ford in the entire Divide travel planning area occurs on the main stem Little Blackfoot River in occupied bull trout and westslope cutthroat habitat and is associated with FR # 4100. This ford crossing is near the beginning of the access route to the Golden Anchor abandoned mine site. The second Little Blackfoot River ford is located at the mouth of Larabee Gulch where a bridge was removed in 1994. This crossing provides important access to the Larabee trail. Since the bridge removal, there is no safe way to cross the stream via full sized wheeled motorized vehicles, and users are fording it on foot, horseback, and to a lesser degree ATVs.

In Ontario Creek, one open ford occurs near its mouth where the stream crosses the floodplain of the Little Blackfoot River and is associated with non-system road 123-013. The other ford is located several miles upstream on Ontario Creek near Bison Creek and is associated with a short segment of the Continental Divide National Scenic Trail (CDNST) that bisects Ontario Creek between FR 4104-A2 and 495-D1. This ford is currently closed to motorized wheeled traffic, but has experienced violations of the closure.

There are three other fords of concern to fisheries managers and all are located in occupied WCT habitat. One ford is located on Sawmill Creek (Upper Dog Creek HUC north of Highway 12); a second is located on an unnamed WCT tributary to Ontario Creek; and the other occurs east of the Divide in Skelly Gulch (Skelly Gulch HUC). All fords are currently open to wheeled motorized use and are an ongoing risk to the local WCT populations in each stream due to hydrologically connected road segments and direct fish egg/fry mortality from wheeled motorized traffic through each ford.

All seven fords are considered high risk unimproved fords where traffic has caused the stream to widen substantially and banks have long ago broken down and washed away. The approach topography at all fords is variable, but each slopes directly into their respective streams resulting in direct sediment delivery during periods of storm runoff or spring breakup.

Observations of traffic disturbance of the channel bottom at all unimproved fords show where most gravel typically associated with trout spawning and rearing habitat was lost and moved from locations where vehicle traffic disrupted the streambed. Common at all ford sites was the lack of coarse and fine woody debris components important for pool formation and retention of streambed material during bankfull discharge. Results of an experimental removal of woody debris from a gravel-bed stream in a forested environment have shown a four-fold increase in bedload transport at bankfull flows (Smith et.al. 1993 pg 153-178). The streambed in the vicinity of all unimproved fords often displays a coarser bottom or higher energy gradient.

Fine sediment becomes re-suspended into the water column during vehicular contact at fords, which becomes replaced during storm runoff events. Sediment plumes at two ford sites were personally observed during vehicle passage. It has also been shown how fords provide opportunities for concentrated recreation use next to fish habitat. Disturbance of riparian areas is tied to concentrated recreational use along high risk routes (see Table 3.28). The largest ford associated with FSR # 4100, when left open, increases the probability of recreational use and its impacts on inland native fish habitat.

Fisheries, Environmental Consequences

Introduction

The direct/indirect and cumulative effects of the action alternatives relative to no action (baseline conditions) on fisheries resources within this travel planning area are presented in this section. To set the stage and lead the reader through the effects discussion, this section opens with a useful background summary on how fish and their habitats can be affected by roads and how those impacts are estimated. Secondary measures used to evaluate effects are included to further clarify specific effects from fords and dispersed campsites. This analysis relies on a GIS-based quantitative approach supplemented with supporting qualitative discussions about crossings and high risk roads for estimating potential effects of all three alternatives on the fisheries resource in the Divide Travel area.

Fisheries Background Summary Related to Road Effects

Direct and Indirect Effects

Fish Habitat

An overview of road effects on streams and fish habitat is distilled from Furniss et al (1991), Waters (1995), the Water/Road Interaction Technology Series (USDA Forest Service 1998), the USDA FS Roads Analysis guide (USDA Forest Service1999), and the Montana Bull Trout Scientific Group report (MBTSG 1998). The primary impacts of roads on fish habitat and populations can be organized under three main categories: 1) accelerated erosion and sedimentation, 2) physical alterations of channel morphology, and 3) fragmentation of fish populations and habitat. Other ways roads impact streams involve changes in hill slope drainage (Hauge et al 1979), changes in organic debris in channels, reduction in streamside vegetative cover, potential chemical contamination, and increased human access to sensitive fish habitat that can lead to impacts on key habitat components and increased angling/poaching pressure.

Chronic *excessive* sedimentation generated as anthropogenic erosion and sediment deposition degrades streams and lowers the natural fish production capabilities of stream bottoms (Waters 1995). Trout use redds (nests dug by fish in bottom gravels) in flowing waters for their reproductive strategy. When chronic *excessive* sediment derived from roads and other sources accrues to trout spawning and rearing areas, it can substantially reduce trout egg/fry survival rates from stream conditions in pristine or unmanaged watersheds. Incubating salmonid eggs and sac-fry rely on gravel permeability for oxygen delivery and the flushing of metabolic wastes. Gravel permeability and, in turn, egg-to-fry survival can be reduced markedly by modest increases in streambed sediment (Everest et al. 1987). Additionally, emerging fry suffer entrapment if an armor of excess fine sediments accrues to spawning beds (Waters 1995, pg 109 citing Hall and Lantz, 1969).

The scientific consensus about forest roads is that they generate the most sediment amongst all forest management activities (Anderson et al. 1976, Furniss 1991). Bechta and Jackson (1979, pg 209) report that flushing of fine sediments from gravels during high flow periods can be offset by stream energy used to transport and intrude additional sediment load as a consequence of upstream landuse activities. Therefore, the greatest attention to techniques for restoring streams and protecting fish habitat has been directed toward more careful planning and design of roads compatible with stream systems (Furniss et al. 1991).

Beyond the problems of excessive sediment upon the embryo and fry stages of trout life, other life history stages can suffer the deleterious effects of excessive sediment. The filling of interstitial spaces of cobble/rubble substrate can seriously reduce critical juvenile rearing habitat for salmonids (MBTSG 1998, pg 10; Waters 1995, pgs 113-114). Pool volume reduced by excessive sediment decreases physical carrying capacity for sub-adult and adult fish during summer growth stages (Waters 1995, pg 111-115; Bjornn and Reiser 1991, pg 122; MBTSG 1998, pg 10). Chronic sedimentation from roads is considered as damaging as that from catastrophic sediment inputs (e.g. wildfire) then again the particles are finer and delivered over longer periods than burned drainages (Furniss et al. 1991). Everest et al. (1987) concluded trout species can cope with natural variability in sediments, but population viability can be reduced by persistent sedimentation that exceeds the natural background levels they evolved in.

Secondly, paralleling roads and road crossings often result in stream adjustments detrimental to fish habitat (Furniss et al 1991). Streams are dynamic and migrate within historic flood plains transporting large woody and organic debris that provides critical physical structure and diversifies aquatic habitat. Floodplain dynamics and processes are modified by road alignment and road fills resulting in the loss of habitat for riparian and aquatic species. Streams constrained by roads and crossings self adjust resulting in less pool frequency or structure, fewer spawning beds, less bank cover, higher energy gradients, and less stable hillslopes wherever streamflows are necessarily diverted to the opposite banks. These changes, in turn, lower the fish production capabilities of stream-riparian habitat.

Third, forest roads often cross streams, and culverts are by far the most common type of crossing structure. Preferred bridge crossings in the planning area make up less than 0.1 percent of all stream crossings. All migratory and many resident trout move extensively upstream and downstream during their life cycles to seek food, cover, spawning areas, and escape detrimental changes in water quality. Culverted crossings often restrict migration of fishes and other stream organisms which can have consequences for fish population viability (USDA-FS 1999, pg 67). When culvert crossings fail, they often do so catastrophically causing failure of fill material at crossings, local scour, streambank erosion, and excessive sediment delivery to downstream fish habitat (Furniss et al. 1991, pg 300). Wood debris and sediment are prone to becoming trapped behind culvert crossings reducing downstream transport and increasing the risk of crossing failure (USDA-FS 1999, pg 65-66). The consequences are often major increased sediment loading and persistent channel damage downstream of failed crossing structures.

Ford crossings associated with the transportation system present another risk element to inland native and non-native fisheries. Fords provide a more direct surface link of road top sediment and chemical transport to the stream than culverted crossings. In addition to sediment transported during periods of rainfall and spring runoff, vehicles crossing unimproved fords degrade water quality as they move through the ford (Sample et al 1999, Taylor 2006). Along with sediment risk is pollution by engine fluids. Taylor (2006) reported oil on gravel beds of the Nueces River from vehicles frequently crossing fords deep enough to dislodge or wash off engine fluids into the stream. Repeat traffic through fords located in sensitive spawning and rearing habitats disturbs these areas such that risk of direct mortality to incubating trout and swim-up fry can occur when traffic directly disturbs bottom substrates where trout lay eggs or emergent fry seek rearing space in the substrates. These risks on TES fish species are common at the large Little Blackfoot River ford on FSR 4100, the Larabee ford, the two fords on Ontario Creek and fords on WCT habitat in Skelly Gulch (FR 1853-A1) and Sawmill Gulch (FR 4005).

Ford crossings also provide access to recreationists that may inadvertently lead to changed patterns of use in riparian habitat and subsequently the potential for detrimental effects on fish (increased fishing pressure, poaching) and fish habitat such as loss of vegetation, soil compaction, bank disturbance and increased sedimentation (Clark and Gibbons 1991 pg 476; MBTSG 1998, pg 41-42). Effects from angler wading to trout eggs and pre-emergent fry were evaluated for brown trout, rainbow trout and cutthroat trout in Montana by Roberts and White (1992). Their findings showed mortality from a single wading event ranged from 0 to 43% depending on stage of egg/fry development. Multiple-wading events resulted in substantial risk in survival of trout eggs and pre-emergent fry; twice-daily wading during egg fertilization to fry emergence killed 83% of cutthroat trout and 89% of brown trout. Brown trout and WCT occupy the Little Blackfoot River along with bull trout and brook trout where more concentrated recreational uses occur associated with dispersed campsites, including the developed Kading campground. As such, the risks for direct trout egg/fry mortality increases near popular streamside camping area such as the large ford site (FSR #4100) on the Little Blackfoot River.

Patterns of more concentrated recreational use have been documented and mapped in the dispersed recreational campsite inventory completed by the Helena Ranger District in 2005. At that time there were 46 dispersed recreational sites associated with stream corridor roads and ford crossings within four west side sub-watersheds south of Highway 12. Nine of the dispersed campsites presented a direct adverse impact on trout habitat. At least four of these dispersed campsites are associated with the large ford crossing on the Little Blackfoot River and two others are tied to the ford crossing in upper Ontario Creek near Bison Creek.

These risks on the fisheries resource are common and ongoing to all alternatives for the Divide travel Planning area because the physical presence of the transportation system and all its crossings remain on the landscape regardless of the decision to administratively close/open roads in the planning area. Excess sediment delivery, stream alteration, and habitat fragmentation are all implicated as common effects under this analysis, and the two measurement indicators used for integrating these impacts on fisheries were identified as: 1) number of *stream-road intersections*, and 2) miles of *high risk roads within 300 feet of streams.* The term "indicator" refers to a measure or characteristic of human-made features that can be interpretable in terms of effects of roads on fisheries values (USDA-FS 1999, pg 46).

In Table 3.29 below, columns 2-5 reflect a quantitative overview of baseline effects specific to Forest Service roads common amongst alternatives.

Table 3.29 Summary of primary and secondary indicators of Forest Service roads on fisheries resources.

6th Field HUC (name)	**Stream-road Intersections**	**Miles high-risk road**	**No. High Risk Campsites[1]**	**No Fords in TES habitat**
Upper Missouri Sub-basin watersheds				
100301011401 (Upper Tenmile Cr)	30	6.07	0	0
100301011402 (Middle Tenmile Cr)	25	3.00	0	0
100301011406	4	0.85	0	0

6th Field HUC (name)	Stream-road Intersections	Miles high-risk road	No. High Risk Campsites[1]	No Fords in TES habitat
(Lower Tenmile Cr)				
100301011403 (Greenhorn Cr)	13	3.70	0	0
100301011404 (Skelly G)	2	1.02	0	1
100301011502 (Upper Silver Cr)	2	0.60	0	0
100301011801 (Iron Horse Cr)	8	1.92	0	0
Sub-total:	84	17.16	0	1
Upper Clark Fork Sub-basin watersheds				
170102010501 (Ontario Cr)	18	2.48	1	3
170102010502 (L.Blackfoot-Larabee)	18	4.18	5	1
170102010503 (Telegraph Cr)	48	8.09	0	0
170102010504 (Mike Renig G)	5	1.75	0	0
170102010505 (Upper Dog Cr)	41	7.00	0	1
170102010506 (Lower Dog Cr)	4	0.84	0	0
170102010507 (L.Blackfoot-Hat)	14	3.10	3	1
170102010601 (North Trout Cr)	10	2.98	0	0
170102010602 (Snowshoe Cr)	14	4.51	0	0
170102010603 (L.Blackfoot-Ellliston)	6	1.47	0	0
170102010604	16	3.69	0	0

6th Field HUC (name)	Stream-road Intersections	Miles high-risk road	No. High Risk Campsites[1]	No Fords in TES habitat
(Carpenter Cr)				
170102010605 (Trout Cr)	1	0.09	0	0
170102010606 (So.Fork. Dog Cr)	2	0.2	0	0
170102010607 (Upper Dog Cr)	6	1.00	0	0
170102010610 (Threemile Cr)	1	0.1	0	0
Sub-total:	204	41.48	9	6
Grand Total:	288	58.64	9	7

[1] High risk campsites in this context relate to those retarding INFISH RMOs or adversely affecting TES fish species or habitat.

In summary, there are 288 FS *stream-road intersections* and 58.64 miles of FS *high risk roads* in the planning area. Currently about 33% (94) of stream crossings and 30% (17.32 miles) of high risk roads are closed to wheeled motorized use. Collateral effects associated with the transportation system relate specifically to access opportunities for concentrated recreational uses along the stream-valley corridor and the effects of high risk ford crossings. There are nine FS dispersed campsites along the Little Blackfoot River and seven fords in TES fish habitat: six fords occur west of the Divide and one ford is east of the Divide in Skelly Gulch where a core conservation population of WCT occurs. Under pristine or unmanaged conditions, these measurement indicators “zero out”.

On non-fishbearing streams an open ford exists west of the Continental Divide directly above Kading Campground where it bisects a small perennial tributary stream approximately 300 feet above its confluence with the Little Blackfoot River. Although situated in unoccupied fish habitat, this site acts as a road sediment delivery site that transport sediment directly to bull trout and westslope cutthroat trout habitat in the Little Blackfoot River when storm runoff or motorized traffic through the ford occurs.

The presence of an extensive road system in the planning area implies an ongoing cumulative disturbance regime upon streams and the fish communities they support (Furniss 1991, pg 297). The magnitude and extent of the primary and secondary indicators is used in this report in making inferences about road hazards because they help determine whether a geomorphic or hydrologic process is impacting the resource of concern or endpoint (USDA FS 1999, pgs 144 and 179).

Based on a review of Tables 3.26, 3.27, and 3.29, the transportation system contributes to accelerated erosion and sediment loading, altered channel morphology, and fragmented fish habitat and populations to varying degrees in most sub-watersheds in the Divide Travel area. A screening of 6th field HUCs in the Divide area shows Upper Tenmile Creek (NRCS 100301011401), Telegraph Creek (NRCS 170102010503), and Upper Dog Creek (NRCS 170102010505) are the

most severely impacted watersheds in the Divide travel planning area as a function of the transportation network. Those experiencing added risks from dispersed campsites and high risk fords include Little Blackfoot River-Hat Creek (NRCS 170102010507), Little Blackfoot River-Larabee Gulch (NRCS 170102010502), and Ontario Creek (NRCS 170102010501). This represents a departure from optimum salmonid habitat under unmanaged/pristine conditions, and also an ongoing effect of the transportation system under the cumulative effects discussion below.

Amongst WCT sub-watersheds east of the Continental Divide, Skelly Gulch and Greenhorn Creek are most at risk from the transportation system. The Greenhorn Creek WCT population may have already gone extinct based on 2010-2012 electrofishing surveys by FS and Montana Department Fish Wildlife and Parks fisheries crews. Of the WCT sub-watersheds west of the Divide those most at risk from roads are those supporting isolated (resident) WCT populations in Snowshoe Creek (NRCS 170102010602), Carpenter Creek (NRCS 170102010604), and North Trout Creek (NRCS 170102010601). The remaining WCT fishery west of the Divide is mostly a connected population with a fluvial component occurring in Dog Creek and the Little Blackfoot River upstream from Elliston. For bull trout habitat in the Divide Travel area, Dog Creek below the Forest boundary and the main stem Little Blackfoot River including Ontario Creek are at high risk as a function of the primary and secondary indicators shown in Table 3.29.

Population Viability

Westslope cutthroat trout are the fish management "indicator species" of concern for the Helena National Forest that represent a measure of the effects of management activities on habitat with the objective of ensuring population viability (Forest Plan pg II-17).

A formal population viability analysis or PVA is restricted to the use of quantitative modeling that estimates risk of extinction over a specified time period, typically 100 years (Ralls et al. 2002, pgs 522-523). These mathematical exercises can be expensive requiring comprehensive data about many factors influencing probability of extinction for a population. Moreover, there are no consensus guidelines on when and how PVA should be applied (Ralls et al 2002, pg 521), and insufficient data to build an appropriate model has proven not feasible to this situation. In practice, agency biologists must assess whether a proposed action will increase the likelihood of loss of viability or lead to a trend toward federal listing of a sensitive species from more limited information and resources.

Therefore this viability analysis focuses on WCT and relies on a recommended alternative method of risk assessment based on viability models by Ruggiero et al. (1994) that center on criteria established by Rieman et al. (1993). More detailed physical and biological effects upon sensitive WCT and listed bull trout are reserved for two separate framework documents, a *biological evaluation* for WCT and a *biological assessment* for bull trout.

Briefly, these more in depth biological analyses borrow from concepts presented in Ruggiero et al. (1994) in conjunction with criteria established by Rieman et al. (1993) such that an analysis of population viability is fundamentally about birth, death, immigration, and emigration rates and how environmental factors affect these rates over time (Ruggiero et al. 1994, pg 366). Select habitat attributes considered important to fish and sensitive to land management disturbances were reviewed in Overton et al. (1995, pg 1). Research has shown how increasing and decreasing levels of sediment in trout reproductive habitat is the common denominator affecting trout embryo and fry survival rates negatively or positively respectively (Waters 1995).

Once fine sediments increase beyond average natural levels in trout spawning habitat (typically 28-30% on Helena NF streams), the reproductive quality of that habitat diminishes

proportionately resulting in corresponding declines in fry production. Risk of increasing the amount of fine sediments in fish spawning habitat rises in drainages as the amount of high risk roads and stream road intersections increases.

In reference to the indicators in Table 3.29, direct and indirect effects to sensitive WCT and listed bull trout (and other salmonids) vary amongst the 6th field HUCs as a function of changes in the amount of open *stream-road intersections* and *miles of high risk road* open in a sub-watershed. Generally, the risk for negative effects to salmonid embryo/fry production including growth and survival increases when more crossings and high risk roads become open and vice versa. Exceptions to this rule can occur whenever key crossings or high risk roads occur in TES habitat that do not change in spite of a net increase/decrease of crossings or roads in other non-fishbearing streams within the same HUC or sub-watershed. Details how these effects indicators relate to the effects specific to each 6th field HUC are reserved for the biological evaluation and biological assessment for the selected alternative. A qualitative overview for the Divide Travel area of road effects upon listed bull trout, sensitive WCT, and western pearlshell mussel common to all alternatives is provided below in Table 3.30.

Table 3.30 Effects projected for WCT, Bull Trout and Western Pearlshell Mussel Habitat Common to all Alternatives.

Fish Species and Habitat	Ongoing Effect of Current Transportation System Common to All Alternatives[1]
Bull Trout	May Affect, Likely to Adversely Affect bull trout based upon magnitude of road hazard indicators in the most impacted 6th field HUCs west of the Continental Divide.
Westslope Cutthroat Trout	May Impact Individuals, but will not likely contribute to a trend toward federal listing or loss of viability of the population or species for populations both sides of the Continental Divide.
Western Pearlshell Mussel	No Effect based on lack of western pearlshell occurrences and predicted habitat in the Little Blackfoot River drainage, and unlikelihood for a change in habitat in lower Tenmile Creek east of the Divide from slight potential changes in sediment delivery resulting from any adjustments in open/closed status of roads.

[1] Effect determination on TES aquatic species and habitat based on determination for most impacted 6th field HUCs in Divide Travel area.

Cumulative Effects

When examining cumulative effects the geographic unit of preference is at the 6th level HUC because fish habitat and fish populations are subject to landuse activities unique to each of those sub-watersheds. There are twenty-two 6th code NRCS watersheds of which seven occur east of the Divide in the Upper Missouri River sub-basin and fifteen occur west of the Divide.

Past and Present (ongoing) Actions

Past and ongoing land-use activities in successive sub-watersheds are outlined in Table 3.31 below as numbers assigned to each activity from a master list of past/ongoing activities in Appendix C. Additionally, cumulative effects from past/ongoing activities in drainages west of the Divide are reflected in 6th field HUC evaluations for the Little Blackfoot portion of the Upper Clark Fork Watershed Baseline (USDA 2000). The combined effects of these activities are

impossible to measure exactly, and the science of watershed management has not produced the tools or techniques that allow managers the capability to quantify cumulative effects with precision and accuracy. Natural ecosystems exhibit wide variation, complexities, and uncertainties that necessarily result in generalized expressions of combined effects.

Although measuring the effects of any project in the context of past and ongoing actions cannot be predicted or measured precisely, it is commonly accepted in watershed practice that the channel is the ultimate integrator of land-use activities including natural processes unique to a given drainage area. The common denominator of various land-use actions affecting fish habitat is excess sediment in the streambed beyond natural background levels (Meehan 1991, pg 5-6). Hence, baseline conditions and the cumulative effect of proposed actions are best measured in the streambed where sediment accrues in critical reaches. Fines sediment in salmonid spawning gravels is the accepted indicator of current habitat conditions and trends on the Helena NF.

Helena Forest fish biologists rely on critical reaches for sampling fine sediments in spawning habitat using McNeil substrate core sampling methodologies (Platts et al. 1983, pgs 17-20). Critical reaches reflect changes in fish habitat as a function of altered sediment yields in a specific drainage area (Stowell et al. 1983). This approach is applied as a practical means to assess existing (baseline) conditions of salmonid spawning habitat from a host of landuse activities, particularly roads. It is also used to help monitor trends in salmonid spawning habitat quality in response to future disturbance activities in a drainage.

Reference sediment levels for the Helena Forest gathered in the 1990s -2000s relied on McNeil Core data from unmanaged drainages or undisturbed portions of drainages on the Helena Forest. It was found that 30% fines represented a plausible mean reference value of fine sediment levels in salmonid spawning habitat; and ± 9.9% about the mean is assumed to be a reasonable measure of natural variation for fisheries management goals based on data collected from Helena NF streams matching Lake Helena 303(d) listed streams. This would equate to fine sediment levels within the range of approximately 20%-40% at most sites in unmanaged drainages.

McNeil core data was obtained from four streams in unmanaged tributaries in the planning area. The first two streams, No Grass Creek and Bison Creek, lie within the Electric Peak roadless area. The other two are unnamed tributaries that lie outside roadless areas but have no roads or vehicle crossings upstream from the sampled reach. Results show average sediment levels for these streams are 28.9, 37.2, 31.4 and 30.2% respectively with a weighted average of the means for all four streams at 31.9%. For this analysis, 30% and 31.9% are used as benchmarks to judge the degree of cumulative effects on area streams using ± 9.9% either side of the mean as a reasonable measure of natural variation for salmonid spawning habitat.

Core sampling data for the Divide travel planning area has not been completed for all sub-watersheds in the planning area, but good representative sampling between 1988 and the present has been obtained from seventeen (of 21) fish-bearing sub-watersheds in the travel planning area that reflect the sediment-generating effects of ongoing landuses and background sediment. Column 4 of Table 3.31 below shows a range of fine sediments by depth (<1/4 in dia.) that likely occur in Divide Travel area streams as a consequence of the cumulative effect from the current transportation system combined with other past and present landuse activities listed in Appendix B. The numbers under column 2 assigned to the individual 6th field HUCs correspond to activities listed in Appendix B and are intended to show which past and present activities are likely responsible for elevated sediment levels in spawning habitat for individual

sub-watersheds. Past or ongoing activities from Appendix B having no effect or risk upon the surface water system have been excluded from consideration in Table 3.31.

Table 3.31 Summary of past and ongoing actions by 6th field HUC in Divide Travel Area using mean % fines (<1/4 inch dia.) in spawning habitat of select streams as an indicator of cumulative effects.

6th Field HUC sub-watershed (name)	Past and ongoing activities[1]	Stream(s) sampled for sediment	Mean % fines in gravels	Helena NF reference (%)	L.Blackfoot reference (%)
Upper Missouri Sub-basin watersheds					
100301011401 (Upper Tenmile Cr)	2, 4, 6, 8, 18, 28, 42, 43, 52, 57, 64, 74, 79, 91, 93, 100	Minnehaha Cr	38.7	30.0	31.9
100301011402 (Middle Tenmile Cr)	4, 6, 9, 18, 19, 29, 37, 64, 96	Walker Cr	52.5	30.0	31.9
100301011403 (Greenhorn Cr)	4, 6, 11, 51, 66, 88, 89	Greenhorn Cr	53.4	30.0	31.9
100301011404 (Skelly G)	4, 16, 75	Skelly G	38.4	30.0	31.9
100301011502 (Upper Silver Cr)	4	- unsampled -	--	30.0	31.9
100301011801 (Iron Horse Cr)	4, 17, 24	Lost Horse Cr	46.3	30.0	31.9
Upper Clark Fork Sub-basin watersheds					
170102010501 (Ontario Cr)	4, 6, 27, 41, 50, 88, 89, 100	Ontario Cr	36.9	30.0	31.9
		Bison Cr	36.9		
		Monarch Cr	37.7		
170102010502 (L.Blackfoot-Larabee)	4, 6, 8, 15, 31, 35, 47, 100	L.Blackfoot @ Larabee G	35.4	30.0	31.9
170102010503 (Telegraph Cr)	4, 6, 27, 30, 32, 36, 38, 41, 50, 57, 64, 67, 73, 76, 88, 89, 94, 100	Telegraph Cr	38.2	30.0	31.9
		Booth G	35.1		
		Sally Ann Cr	43.1		
170102010504 (Mike Renig G)	4, 18, 69	Mike Renig G	50.5	30.0	31.9

6th Field HUC sub-watershed (name)	Past and ongoing activities[1]	Stream(s) sampled for sediment	Mean % fines in gravels	Helena NF reference (%)	L.Blackfoot reference (%)
170102010505 (Upper Dog Cr)	4, 11, 12, 13, 16, 21, 24, 27, 29, 34, 46, 53, 54, 64, 65, 71, 82	Hope Cr	42.8	30.0	31.9
		LaSalle G	40.4		
170102010506 (Lower Dog Cr)	4, 9, 11, 19, 57, 66, 83, 96	- unsampled -	--	30.0	31.9
170102010507 (L.Blackfoot-Hat Cr)	4, 14, 15, 27, 41, 43, 61, 64, 84, 87, 94, 99, 100	L.Blackfoot @ Hat Cr	37.8	30.0	31.9
170102010601 (North Trout Cr)	4, 21, 27, 33	- unsampled -	--	30.0	31.9
170102010602 (Snowshoe Cr)	4, 13, 27, 40, 60, 64, 82	Snowshoe Cr	60.7	30.0	31.9
170102010603 (L.Blackfoot-Ellliston)	4, 14, 27, 70, 83, 85	Elliston Cr	36.7	30.0	31.9
170102010604 (Carpenter Cr)	4, 6, 13, 62, 64, 72, 86	Carpenter Cr	48.3	30.0	31.9
		N.Fk. Ophir Cr	22.2		
170102010605 (Trout Cr)	4, 14, 18, 23	Trout Cr	36.1	30.0	31.9
170102010606 (So.Fork. Dog Cr)	4, 20,	- unsampled -	--	30.0	31.9
170102010607 (Upper Dog Cr)	4, 20, 23, 27	Spotted Dog Cr	39.9	30.0	31.9
170102010610 (Threemile Cr)		Threemile Cr	33.3	30.0	31.9

[1] Numbers correspond to an activity listed in Appendix C as a likely sediment contributor to a specific 6th code HUC.

Reasonably Foreseeable Future Actions

Reasonably foreseeable projects or programs considered for review can be found in Appendix B. Foreseeable actions are discussed qualitatively in terms of how they might influence trends in sedimentation and subsequently, salmonid spawning habitat.

The *Telegraph Creek Mountain Pine Beetle (MPB) Salvage project* involves the removal of MPB infested stands of mostly lodgepole pine trees on about 8,000 acres of land within the Telegraph Creek, Ontario Creek and Mike Renig 6th field HUCs. This would also include a pre-commercial

thinning component. There may be accelerated erosion and sediment delivery into downstream fisheries habitat from high risk roads proposed for log hauling and access to and from treatment units. Each large-scale vegetation treatment project has a road improvement package with mitigation and design measures intended to sequester sediment as an important component of the project. With implementation of the road improvement component, the risk of accelerating sediment delivery into streams within the three sub-drainages is predicted to be low. There would be high risk for short-term sediment increases during initial road improvement stages as specified segments of high risk roads would be subject to temporary ground disturbance in preparation for hauling logs.

Foreseeable livestock grazing decisions would continue authorizing cattle grazing on *Austin C&H*, *MacDonald Pass C&H*, *Empire C&H* allotments. This may contribute to cumulative effects on fisheries. Grazing management would be maintained through a permit with established numbers and season of use. The fisheries report for the *Austin C&H allotment* (Harper 2006) located east of the Divide and north of highway 12 describes a marginal stream system that lacks surface flows with no fisheries. Therefore, it is anticipated as having no risk to the nearest downstream fishery in Tenmile Creek.

A fisheries biological assessment for the *MacDonald C&H allotment* (Walch 2006) that relies on the adaptive management concept anticipates that risk of negative effects to inland native species habitat in Dog Creek and the Little Blackfoot River (Lower Dog Creek HUC and Little Blackfoot River—Elliston HUC) would be minimal. Due to the cumulative effects of heavy grazing and subsequent sediment delivery on private land adjacent to the Forest boundary in Rich Spur Creek, Latham Gulch, and Miles Gulch, the biological assessment made a “may affect/impact, not likely to adversely affect” determination for inland native species.

The same anticipated effects would apply to the *Empire C&H allotment* based on the biological assessment (Harper and Walch 2006) completed for this project. Risk to TES fish habitat would be low with continuation of livestock grazing on this allotment, but were elevated somewhat to reflect the cumulative effects of other past/ongoing activities on private lands adjacent Forest lands in the Upper Dog Creek HUC.

Within the Upper Missouri River sub-basin side of the Divide Travel area, the *Tenmile Road Improvement* project reasonably foreseeable future project would likely influence sediment levels in Tenmile Creek. This project involves re-aligning several road segments, replacing three bridges and paving about six miles of County Road # 695 from Highway 12 to the community of Rimini. Therefore, this project would risk delivering fine sediment into nearby Tenmile Creek in the short term as this road parallels Tenmile Creek up to the Rimini townsite. Ground disturbance activities associated with the project would increase sediment risk until paving and re-vegetation of disturbed areas is complete. In the long term, sediment delivery into nearby Tenmile Creek would decrease substantially due to the paving of this road. This may be offset by county winter sanding operations expected for this route.

Several road improvement projects would replace ten undersized culverts on streams; install approximately 57 new cross drain culverts; reconstruct/recondition 18.1 miles of road with new surface aggregate; and raise the roadbed two feet south of Hat Creek under the American Restoration and Recovery Act. These treatments would potentially have short-term sediment delivery risks to fisheries in the Little Blackfoot-Larabee HUC, Little Blackfoot-Hat HUC, Telegraph HUC, and Upper and Lower Dog Creek HUCs. In the long-term, however, these road improvements would lower sediment delivery risk within these HUCs. These projects, would not

eliminate a stream-road intersection or paralleling route, but would mitigate the sediment effects at these crossings and reduce sediment delivery from high risk roads.

The *Golden Anchor Road project* involves construction of an approximately 60 foot span bridge over an existing ford on the Little Blackfoot River. This would mitigate the impacts of an existing ford by reducing sediment delivery to surface waters, and eliminating direct instream disturbance from wheeled motorized use.

The *Tree Farm Road* project would result in reconstruction of approximately 3.4 miles of road FSR #314 including three miles of surfacing, four new drain dips and two 18" diameter cross drain culverts. Road drainage repairs would blade over 54 miles of road, construct drain dips and result in one new 18" diameter cross drain culvert. The risks of all road treatments and stream crossing upgrades would be short-term sediment increases as a consequence of construction disturbance needed to improve the transportation system in the following 6th field HUCs: Upper Tenmile Creek, Upper Dog Creek, Snowshoe Creek, Ophir Creek, Lower Little Blackfoot-Elliston Creek, and Greenhorn Creek. For the long-term, these road improvement measures serve to reduce sediment risk to fish habitat. Any high risk roads open to administrative use however, would not be removed that remain administratively open would not be removed and would require ongoing maintenance to minimize sediment risk to the stream system.

A hazardous mine waste reclamation project is planned in Tenmile Creek (Upper Tenmile Creek HUC). The *Tenmile EPA Reclamation* project plans to remove up to 50,000 cubic yards of contaminated soil around the town of Rimini and re-establish vegetation on all areas subject to hazardous waste/soil removal. This action may increase risk for sediment delivery to Tenmile Creek in the short-term associated with disturbance activities needed to remove contaminated soils in the Rimini townsite. This project would reduce risk of contaminate soils entering Tenmile Creek, especially during high flow conditions over the long-term because a major source of contaminated soils would be removed and revegetated leading to a general trend of reduced sediment delivery and metals contamination in Tenmile Creek.

Effects Common to All Alternatives

The physical presence of the transportation system as it pertains to the high risk road segments including associated crossings and dispersed campsites outlined under Table 3.29 remain on the landscape as an ongoing (cumulative) effect to fish habitat regardless of any decision to administratively close/open roads. No alternative under this decision serves to directly eliminate or relocate the physical presence of those features from stream corridors. Therefore, sediment delivery from high risk roads remains common to all alternatives simply due to where and how certain road segments are hydrologically connected to the stream system. Large volumes of sediment held in storage as roadfills associated with some culverts remain at risk for being eroded and deposited downstream into fish habitat. Where stream crossings and roads encroach on streams there would continue to be alterations of channel morphology and floodplain processes resulting in less pool frequency, less bank cover, reduced spawning gravels, higher energy gradients, and partially fragmented fish habitat that limit fish migration.

Effects Common to All Action Alternatives

Each action alternative has the common element to either close or open a pre-determined amount of high risk roads (and associated crossings) and place seasonal restrictions on some routes in the planning area. This would directly affect the nature and extent of recreation use in

riparian corridors and indirectly affect fish habitat (Clark and Gibbons 1991, pg 476). Opening high risk routes that are currently closed would potentially accelerate sedimentation and disrupt fish habitat.

Proposals to close some high risk roads (and associated crossings) would likely cause them on becoming passively revegetated over the long term resulting in the reduction of sediment runoff into the stream system. Roads proposed for closure would also improve opportunities for future obliteration or recontouring projects under an implementation plan that would help to restore watershed function and fish habitat. The tradeoff of closing roads is the potential to neglect monitoring and maintenance activities on crossings increasing the odds for culvert plugging and failure if these structures are not removed soon after the road is closed.

The proposed 300 foot language for the planning area would allow for wheeled motorized travel off designated routes up to 300 feet with some restrictions intended to mitigate potential resource damage. Unless signed, wheeled motorized travel would be allowed within 300 feet of designated routes as long as: 1) no new permanent routes are created, 2) no damage to existing vegetation, soils or water resource occur, 3) travel off-route does not cross streams, and 4) travel off-route does not traverse riparian or wet areas. Without clearly defined designated routes to dispersed campsites, there is potential for the creation of new user-created routes and dispersed camps at public user's discretion.

A reasonably foreseeable federal action common amongst all alternatives is additional review of roads to determine which segments on both open and closed roads are having adverse effects to inland native fish habitat prerequisite to developing a plan to minimize those effects. This future federal action moves the Forest closer in meeting the intent of avoiding adverse effects to inland native fish and fish habitat.

Alternative 1, No Action

Direct and Indirect Effects

The No Action Alternative has the direct effect of maintaining the status quo in terms of open high risk roads and stream crossings in the planning area (Tables 3.26 and 3.27). Currently there are 58.64 miles of high risk FS roads and 288 stream crossings in the planning area. Seventy percent of the FS high risk roads and 67% of FS stream crossings would remain open to wheeled motorized use. The indirect effect of No Action would be continued risk for accelerated sediment delivery into the surface water system and sediment accrual into fish habitat over natural background levels.

Dispersed recreational campsites associated with the FS transportation system in the planning area south of Highway 12 totaled 46 in 2005. Nine of these dispersed campsites are located directly on the banks of streams: eight on the Little Blackfoot River and one on Ontario Creek. Surveys found these nine dispersed campsites inhibit attainment of RMOs under INFISH. The direct effect of the No Action alternative would be continued concentrated recreation use at these nine campsites indirectly generating observable impacts (Table 3.28) to stream-riparian habitat adjacent these dispersed campsites without measures to address concentrated recreation use at each site.

Seven unimproved fords on TES fish habitat exist on the current transportation system. The direct effect of No Action would be to maintain the open status of six of the seven fords to wheeled vehicle traffic. Four fords (three are open) occur in bull trout occupied habitat, and the

three other open fords occur on sensitive WCT streams. The direct effect of Alternative 1 is to maintain the status quo of leaving open six fords to wheeled vehicle use. The indirect effect would be ongoing motorized vehicular disturbance to the channel at open fords, sediment delivery, and risk for direct mortality to bull trout and WCT incubating eggs and fry at open fords.

Irreversible and Irretrievable Commitments

There is no irreversible commitment or permanent loss of future options in regards to the existing road system. Under No Action, it remains doable for any road--closed or open--that is adversely affecting water quality, stream function, TES fish habitat or public safety, to be removed or relocated so that stream processes can be restored which would be beneficial to water quality and fish populations.

There would be an irretrievable (temporary) commitment of resources in the matter of ongoing road sediment delivery to fish-bearing habitat as a result of some road locations resulting in a direct surface flow path (hydrologic connection) to streams within the planning area. Approximately 8.2% of the existing transportation system consists of FS *high risk roads* including associated FS *stream-road intersections* that can cause an irretrievable commitment or temporary loss of fish habitat quality restorable by eliminating or relocating the roads. High risk roads represent an ongoing cumulative effect when left untreated would continue to diminish the reproductive capability of fish habitat within the planning area.

Culverts present an ongoing risk for releases of substantial stores of sediment in the form of roadfills at culvert crossings and potential barriers to fish migration. Culverts that either have not been removed or upgraded with bridges or AOP-compliant structures designed to pass 100-year floods impose an irretrievable commitment upon stream-riparian dependent fisheries.

Cumulative Effects

Past, present, and reasonably foreseeable future actions applicable to Divide travel planning area sub-watersheds can be found in Appendix B. The transportation system in the planning area was excluded from this list as it is addressed in more detail under this section and the background discussion for fish habitat in the Fisheries Affected Environment section above.

Tables 3.26 and 3.27 in the Affected Environment section provide a quantitative overview of all the *stream-road intersections* and miles of *high risk roads* in each 6th field HUC (sub-watershed) of the Divide travel planning area. Each table refines road effects indicators by outlining those under open road and closed road status for each sub-watershed.

There are approximately 719 miles of road in the planning area, and about 78.4 miles are considered *high risk roads* that can risk chronic excessive sediment delivery to the surface water system, fragment stream habitat, and/or alter stream-floodplain functions. The Forest Service maintains jurisdiction on about 58.6 miles of *high risk* roads, and 17.3 miles (30%) of these are closed under the No Action Alternative. Private and county roads account for the other 19.8 miles of high risk roads; these non-FS roads represent an ongoing cumulative effect to the surface water system in the planning area.

There are also approximately 378 *stream-road intersections* (crossings) in the planning area. The Forest Service has jurisdiction on about 288 crossings, and 94 FS crossings (33%) are closed under the No Action Alternative. Stream crossings are principal access sites for road sediment into the stream system. Due to their presence in the various planning area drainages, chronic

road sediment delivery and physical alteration of stream habitat would remain an ongoing cumulative effect on fisheries habitat in the planning area.

Additionally, Forest Service *dispersed recreation campsites* and *fords* open to public access contribute to ongoing cumulative effects under this alternative. Nine dispersed campsites are directly adjacent TES fish habitat, and six open fords occur on TES fishery streams, which risks chronic disturbance of the streambed to direct motorized wheeled vehicle use and direct mortality of incubating trout eggs and fry. A seventh ford located in Ontario Creek is currently closed to wheeled motorized traffic.

In non-fishbearing streams, a ford occurs on an unnamed tributary to the Little Blackfoot River above Kading Campground. This ford does not directly risk mortality to salmonid embryos and fry, but provides a gateway for chronic sediment delivery into inland native fish habitat of the Little Blackfoot River.

Alternative 2

Direct and Indirect Effects

Alternative 2 has the direct effect of closing a net total of approximately 7.46 miles (13%) of FS *high risk* roads to motorized wheeled vehicle use in the planning area. Table 3.32 summarizes changes in the amount of open *high risk* roads for each 6th field HUC. Twelve sub-watersheds would experience a reduction in open *high risk* roads; therefore, as an indirect effect they would potentially experience reductions in long-term sediment delivery including increased opportunities to obliterate roadbeds that restore natural drainage and stream habitat. Seven sub-watersheds would experience no change in the current open status of *high risk* roads so the indirect effect in these drainages reflects the No Action alternative in terms of sediment delivery risk.

Three sub-watersheds west of the Divide would undergo a net increase in open *high risk* roads from their current levels as a direct effect of this alternative (Table 3.32). These include Ontario Creek, Mike Renig Gulch, and the Elliston sub-watershed portion of the Little Blackfoot River drainage. The expanded *high risk* road openings are a result of proposals to open closed road FSR #4104-A2 in Ontario Creek; road FSR #1865 in the Mike Renig drainage; and roads FSR #314-A1 and FSR #314-E1 in Elliston Creek.

The indirect effect of opening more high risk roads to wheeled motorized use relates to increasing risk of sediment production and delivery to streams that can impact trout reproduction. Road traffic is recognized to increase production of road sediment ranging from 2 to 30 times the sediment production compared to roads without traffic (Luce and Black 2001, pg 1). Surface rutting resulting from repeat traffic was reported to increase sediment production 200-500 percent in contrast to unrutted roads (Burroughs and King 1989, pg 1; Kennedy 1997). Foltz (1999, pg 3) reported 96 percent to 99 percent of the sediment generated from road surfaces of high to marginal aggregate surface quality was less than 6 mm in diameter. A major concern for fisheries management is the accrual of excess sediment less than 6.4 mm in size into salmonid spawning and rearing habitat. Waters (1995, pgs 86-109) provides an overview of research on sediment that show most reductions in egg-embryo success result when sediment particles of 0.83 mm and smaller occur in redds in proportions of about 15 percent or higher. Fry mortality increases as larger sediment particles (3-6 mm in size) increase in overlying strata.

Table 3.32 Miles and net changes of FS open *high risk roads* (miles) by watershed

6th Field HUC	Alt 1	Alt 2	Net change
Upper Tenmile Cr	4.35	4.30	-0.05
Middle Tenmile Cr	2.35	2.18	-0.17
Lower Tenmile Cr	0.85	0.83	-0.02
Greenhorn Cr	3.55	0.74	-2.81
Skelly G	0.95	0.28	-0.67
Upper Silver Cr	0.60	0	-0.60
Iron Horse Cr	1.41	1.41	0
Ontario Cr	1.64	1.99	+0.35
L.Blackfoot-Larabee	1.84	1.39	-0.45
Telegraph Cr	5.03	4.59	-0.44
Mike Renig Cr	0	0.10	+0.10
Upper Dog Cr (N)	6.73	4.50	-2.23
Lower Dog Cr	0.84	0.73	-0.11
L.Blackfoot-Hat Cr	1.85	1.41	-0.44
North Trout Cr	2.98	2.98	0
Snowshoe Cr	3.76	3.29	-0.47
L.Blackfoot-Elliston	0.74	1.29	+0.55
Carpenter Cr	0.79	0.79	0
Trout Cr	0.09	0.09	0
So.Fork Dog Cr	0.12	0.12	0
Upper Dog Cr (S)	0.85	0.85	0
Threemile Cr	0	0	0
Total:	41.32	33.86	-7.46

Table 3.33 Numbers and net change of FS open *stream-road intersections* by watershed

6th Field HUC	Alt 1	Alt 2	Net change
Upper Tenmile Cr	20	20	0
Middle Tenmile Cr	18	20	+2
Lower Tenmile Cr	4	4	0
Greenhorn Cr	13	4	-9
Skelly G	2	1	-1
Upper Silver Cr	2	0	-2
Iron Horse Cr	7	7	0
Ontario Cr	10	13	+3
L.Blackfoot-Larabee	4	4	0
Telegraph Cr	29	31	+2
Mike Renig Cr	0	1	+1
Upper Dog Cr (N)	39	34	-5
Lower Dog Cr	4	3	-1
L.Blackfoot-Hat Cr	8	3	-5
North Trout Cr	10	10	0
Snowshoe Cr	10	9	-1
L.Blackfoot-Elliston	3	5	+2
Carpenter Cr	5	5	0
Trout Cr	1	1	0
So.Fork Dog Cr	1	1	0
Upper Dog Cr (S)	4	4	0
Threemile Cr	0	0	0
Total:	194	180	-14

Alternative 2 also has the direct effect of closing a net total of approximately 14 stream crossings to motorized wheeled vehicle use in the planning area. Table 3.33 summarizes changes in the amount of open *stream route intersections* in each sub-watershed. Seven drainages would experience a reduction in open stream crossings; therefore, as an indirect

effect they would potentially experience reductions in long-term sediment delivery and increased opportunities to remove crossing structures to restore natural drainage and stream habitat. Nine sub-watersheds would experience no change in the current open status of stream crossings so the indirect effect in these drainages reflects the No Action alternative in terms of sediment risk and opportunity in restoring drainage.

Five sub-watersheds, one east and four west of the Divide, would undergo an increase in crossings open to wheeled motorized vehicle use from their current levels as a direct effect of this alternative (Table 3.33). These include Middle Tenmile Creek (east of the Divide), Ontario Creek, Telegraph Creek, Mike Renig Gulch, and the Elliston sub-watershed portion of the Little Blackfoot River drainage. The additional open crossings would be the result of proposals to open closed road # 4104-A1/A2 in Ontario Creek; road #1865 in the Mike Renig drainage; and roads 314-A1 and 314-E1 in Elliston Creek. East of the Divide the two stream crossings that would be opened to wheeled motorized vehicle use are associated with opening road # 335-A in Sweeny Creek to wheeled motorized traffic.

The indirect effect of opening these closed crossings to wheeled motorized use is increased risk of sediment production and delivery to streams that can impact trout reproduction. Where roads are proposed to be closed, the tradeoff is the potential to neglect monitoring and maintenance activities on crossings, thereby increasing the odds for culvert plugging and failure (Don Senn and DJ Johnston, pers. comm.). Opening a road is likely to have the indirect effect for increased surveillance and maintenance of crossings.

Effects of Alternative 2 Specific to Occupied Bull Trout Habitat and Westslope Cutthroat Trout Habitat:

Seven fords are located on streams supporting WCT, and four of these occur on habitat that also supports listed bull trout. A direct effect of Alternative 2 would be the closing of all four fords in bull trout occupied habitat to wheeled motorized vehicle. One ford (non-system road 123-013) would be permanently closed and three other fords (located on roads 4100, 227-D1, 4104-A1/A2) temporarily closed until a bridge or other bottomless “Aquatic Organism Passage (AOP) compliant” structure would be installed under a mitigation plan that protects native species. This reduces the risk of direct mortality to the early life history stages of bull trout and WCT in Ontario Creek and the Little Blackfoot River. In upper Ontario Creek the ford (road 4104-A1/A2) in bull trout habitat is currently closed but would be opened seasonally (from May 16 to October 14) under this alternative. To protect instream habitat and early life stages of native trout, this ford would remain closed until a bridge or other bottomless structure could be installed in its place. Risk for direct mortality to bull trout in the Little Blackfoot River and Ontario Creek is considered to be very low currently due to their extremely low numbers as observed and documented in the latest electrofishing surveys between 2008 and 2012 by FS and MDFW&P fisheries crews.

The balance of open fords on fishbearing streams occurs in WCT habitat in Skelly Gulch east of Divide (road 1853-A1), Sawmill Gulch (road 256), and an unnamed tributary to Ontario Creek (road 495-D1). Because of its high importance to WCT conservation east of the Divide, the ford (and its associated high risk road) on Skelly Gulch would be closed. The direct effect on WCT habitat in Skelly Gulch would be the elimination of wheeled motorized traffic through WCT habitat. The indirect effect would be the reduction of chronic sediment delivery into WCT habitat and the protection of incubating WCT embryo and fry from direct mortality associated with wheeled motorized traffic through the stream. In Sawmill Gulch and the Ontario tributary proposed mitigation to protect WCT would be to close the crossings until an approved AOP

compliant structure sized to pass 100-year flood flows could be installed. This would have the indirect effect of protecting WCT from potential direct mortality from wheeled motorized traffic through the creek bed.

Four dispersed campsites serviced by non-system road 123-013 would close as a direct effect of closing road 123-013 under this alternative. This would eliminate the concentrated recreation activity along the banks of the Little Blackfoot River adjacent the dispersed campsites and have the indirect effect of passive re-vegetation on disturbed ground along this segment of the Little Blackfoot River.

Roads and crossings on TES fish habitat that would be opened under Alternative 2 occur in the Little Blackfoot River-Larabee, Little Blackfoot River-Elliston, and Telegraph HUCs. Road 227-E1 extends beyond Kading Campground in the Little Blackfoot River-Larabee HUC and would remain open to wheeled motorized vehicles 50" and less seasonally from May 15 to October 14. Approximately 0.6 miles of high risk road includes one ford crossing and two high risk dispersed campsites associated with the road. Keeping this route open would have a direct effect for potential adverse effects on inland native fish habitat.

In the Little Blackfoot-Elliston HUC, the direct effect of this alternative would be opening approximately 0.5 miles of high risk road including two crossings on Elliston Creek increasing the risk for sediment delivery into WCT habitat. In Telegraph Creek, opening roads 1857-D1 and 1857-D2 to wheeled motorized use would have the direct effect of allowing wheeled motorized use on currently closed segments of road that have two stream crossings. The indirect effect of this decision relates to increased risk for sediment delivery into WCT habitat in Booth Gulch.

With these exceptions, the overall direct effect on WCT drainages in the planning area would be the elimination of wheeled motorized traffic travel on 0.67 miles of *high risk* road in WCT drainages east of the Divide and approximately 4.1 miles of *high risk* road in WCT drainages west of the Divide. The WCT drainage east of the Divide that would benefit is Skelly Gulch. In Skelly Gulch, approximately 0.4 miles of hydrologically connected road and an active ford would be closed as a direct effect of this alternative. Greenhorn Creek is questionable whether it still contains WCT based on the latest findings by FS and MDFWP fisheries crews. This drainage would experience the direct effect of having 2.8 miles of high risk road including nine crossings closed to wheeled motorized traffic. The indirect effect of these closures on WCT habitat is the reduction of chronic sedimentation into the surface water system.

Effects of Alternative 2 Specific to Western Pearlshell Mussel Habitat

Western pearlshell mussels do not occur in the Little Blackfoot River or any of its tributaries in the planning area. Additionally, with the exception of Tenmile Creek (east of the Divide) below the confluence of Walker Creek, no stream reaches have been designated as predicted western pearlshell habitat based on surveys by Stagliano (2010). The Divide travel planning area therefore is not likely to impact western pearlshell mussels or habitat in or downstream of the planning area west of the Divide.

In the fisheries analysis, increased excess sedimentation was discussed as an environmental stressor most probable to adversely affect salmonids from open roads and crossings. Increased sedimentation is also one of the stressors of concern to western pearlshell mussels (Box and Mossa 1999). Research has found that eliminating ongoing vehicular disturbance on existing roads reduces the amount of sediment delivered to streams from those routes. Sediment yields from the planning area transportation system are unlikely to increase because there would be no increases in the amount of high risk roads and crossings open to wheeled motorized vehicle

use in the Upper Tenmile HUC. The two crossings in Middle Tenmile Creek opened under this alternative are remotely located from predicted pearlshell mussel habitat in lower Tenmile Creek and lack connectivity to lower stream reaches of Tenmile Creek.

Irreversible and Irretrievable Commitments

There is no irreversible commitment or permanent loss of future options in regards to the existing road system under Alternative 2. It remains doable for any FS road, whether closed or open that is adversely affecting water quality, stream function, TES fish habitat or public safety, to be removed or relocated so that stream processes can be restored which would be beneficial to water quality and fish populations.

There would be an irretrievable (temporary) commitment of resources in the matter of ongoing road sediment delivery to fish-bearing habitat as a result of some road locations resulting in a direct surface flow path (hydrologic connection) to planning area streams. Approximately 8.2% of the existing transportation system consists of FS *high risk roads* including associated FS *stream-road intersections* that can cause an irretrievable commitment or temporary loss of fish habitat quality restorable by eliminating or relocating the roads. High risk roads represent an ongoing cumulative effect when left untreated would continue to diminish the reproductive capability of fish habitat within the planning area.

Under designed culverts present an ongoing risk for releases of substantial stores of sediment in the form of roadfills at culvert crossings and potential barriers to fish migration. Culverts at risk that have not been removed or upgraded with AOP-compliant ones designed to pass 100-year floods impose an irretrievable commitment upon stream-riparian dependent fisheries.

Cumulative Effects

Past, present, and reasonably foreseeable future non-road actions applicable to the Divide travel planning area are addressed in Appendix C. As an ongoing effect, Tables 3.26 and 3.27 in the Affected Environment section provide a quantitative overview of all stream-road intersections and miles of high risk roads in each 6th field HUC encompassed by the Divide travel planning area. Both tables further refine the two road measures by outlining the amounts currently open versus closed for each sub-watershed.

There are approximately 719 miles of road in the planning area with about 78.4 miles considered *high risk roads* that can cause chronic excessive sediment delivery to the surface water system, fragment stream habitat, and/or alter stream-floodplain functions. The Forest Service maintains jurisdiction on about 58.6 miles of *high risk* roads. Under action Alternative 2, about 33.86 miles of high risk FS roads would be open and 24.78 miles (17.32 miles currently closed plus 7.46 proposed miles) or 42% would be closed to wheeled motorized vehicle use. Private and county roads account for 19.8 miles of high risk roads; these non-FS roads represent an ongoing cumulative effect to the surface water system in the planning area.

There are also approximately 378 *stream-road intersections* (crossings) in the planning area, and the Forest Service has jurisdiction on 288 crossings. About 108 FS crossings (37%) would be closed under this alternative. Stream crossings are principal access sites for road sediment into the stream system. Due to their presence in the various planning area drainages, chronic road sediment delivery and physical alteration of stream habitat would remain an ongoing cumulative effect on fish habitat in the planning area.

Additionally, nine FS dispersed campsites associated with high risk roads are directly adjacent TES fish habitat, and wheeled motorized access to four of these would be closed as a result under this alternative. The other five dispersed recreation campsites would remain open to public users and continue to negatively affect TES fish habitat without mitigations. Six currently open fords on TES fish streams would experience permanent or temporary closures to reduce risk of direct mortality to WCT and bull trout. A seventh closed ford located in Ontario Creek would remain closed to wheeled motorized traffic. The physical presence of these fords would continue to risk ongoing sediment delivery to TES fish habitat until measures under an implementation plan could replace the fords or rehabilitate crossings proposed for closure in this alternative.

In non-fishbearing streams, a ford on an unnamed tributary to the Little Blackfoot River above Kading Campground would remain open risking continued chronic sediment delivery into inland native fish habitat of the Little Blackfoot River. There would be no risk of direct fish mortality at this ford crossing.

Alternative 3

Direct and Indirect Effects

Alternative 3 has the direct effect of closing approximately 13.34 miles (23%) of FS *high risk* roads to motorized wheeled vehicle use in the planning area. Table 3.34 summarizes changes in the amount of open *high risk* roads for each 6th field HUC. Fourteen sub-watersheds would experience reductions in the miles of open *high risk* roads; therefore, the indirect effect would be the potential for substantial reductions in long-term sediment delivery in planning area streams and increased opportunities to obliterate roadbeds that restore natural drainage and stream habitat. Eight sub-watersheds would experience no change in the current open status of *high risk* roads so the indirect effect in these drainages reflects the No Action alternative in terms of sediment delivery risk.

Alternative 3 also has the direct effect of closing approximately 48 FS stream-road crossings to wheeled motorized vehicle use in the planning area. Table 3.35 summarizes changes in the amount of open *stream route intersections* for each sub-watershed. Thirteen drainages would experience a reduction in the number of open stream crossings to wheeled motorized vehicle use; therefore, an indirect effect would be the potential reductions in long-term sediment delivery and increased opportunities to remove crossing structures that restore natural drainage and stream habitat. Nine sub-watersheds would experience no change in the current open status of stream crossings so the indirect effect in these drainages reflects the No Action alternative in terms of sediment risk and opportunity in restoring drainage. Unlike the other action alternatives, no sub-watersheds in the planning area would experience any increase in open *high risk* roads or *stream-road intersections*; that is, going from closed to open status.

Table 3.34 Miles and net changes on FS open *high risk roads* (miles) by watershed

6th Field HUC	Alt 1	Alt 3	Net change
Upper Tenmile Cr	4.35	4.30	-0.05
Middle Tenmile Cr	2.35	1.00	-1.35
Lower Tenmile Cr	0.85	0	-0.85
Greenhorn Cr	3.55	0.74	-2.81
Skelly G	0.95	0.28	-0.67
Upper Silver Cr	0.60	0	-0.60
Iron Horse Cr	1.41	1.41	0
Ontario Cr	1.64	1.64	0
L.Blackfoot-Larabee	1.84	0.49	-1.35
Telegraph Cr	5.03	4.11	-0.92
Mike Renig Cr	0	0	0
Upper Dog Cr (N)	6.73	4.50	-2.23
Lower Dog Cr	0.84	0.73	-0.11
L.Blackfoot-Hat Cr	1.85	0.59	-1.26
North Trout Cr	2.98	2.98	0
Snowshoe Cr	3.76	3.29	-0.47
L.Blackfoot-Elliston	0.74	0.74	0
Carpenter Cr	0.79	0.79	0
Trout Cr	0.09	0.09	0
So.Fork Dog Cr	0.12	0	-0.12
Upper Dog Cr (S)	0.85	0.30	-0.55
Threemile Cr	0	0	0
Total:	41.32	27.98	-13.34

Table 3.35 Numbers and net changes on FS open *stream-road intersections* by watershed

6th Field HUC	Alt 1	Alt 3	Net change
Upper Tenmile Cr	20	20	0
Middle Tenmile Cr	18	9	-9
Lower Tenmile Cr	4	0	-4
Greenhorn Cr	13	4	-9
Skelly G	2	1	-1
Upper Silver Cr	2	0	-2
Iron Horse Cr	7	7	0
Ontario Cr	10	10	0
L.Blackfoot-Larabee	4	2	-2
Telegraph Cr	29	26	-3
Mike Renig Cr	0	0	0
Upper Dog Cr (N)	39	34	-5
Lower Dog Cr	4	3	-1
L.Blackfoot-Hat Cr	8	1	-7
North Trout Cr	10	10	0
Snowshoe Cr	10	9	-1
L.Blackfoot-Elliston	3	3	0
Carpenter Cr	5	5	0
Trout Cr	1	1	0
So.Fork Dog Cr	1	0	-1
Upper Dog Cr (S)	4	1	-3
Threemile Cr	0	0	0
Total:	194	146	-48

The indirect effect of closing more of these elements to wheeled motorized vehicle traffic compared to other action alternatives would be the potential for maximizing reductions in

sediment production and delivery to streams in the planning area. Research has demonstrated how minimizing or eliminating motorized use over roads and crossings substantially reduces road sediment delivery to streams (Luce and Black 2001, pg 1; Burroughs and King 1989, pg 1; Kennedy 1997; Foltz 1999). Waters (1995, pgs 86-109) provides an overview of research on sediment that show most reductions in egg-embryo success result when sediment particles of 0.83 mm and smaller occur in redds in proportions of about 15 percent or higher, and fry mortality increases as larger sediment particles (3-6 mm in size) collect in the overlying strata. Alternative 3 would minimize long term sediment delivery to fish habitat in the planning area by discontinuing wheeled motorized use over the highest amount of high risk roads and crossings. This alternative would provide for the highest miles of *high risk* roads amongst alternatives that could potentially be obliterated to restore natural drainage and eliminate sources of chronic sediment delivery in fourteen sub-watersheds.

The tradeoff of closing high risk routes and associated stream crossings, is the direct effect of neglecting monitoring and maintenance activities on crossings located on roads closed year-round to wheeled motorized vehicles. Once a road is closed it likely would not receive the level of review accorded an open road given the constraints of resources available (Don Senn and DJ Johnston, pers. comm.). The indirect effect of neglecting monitoring and maintenance of culvert crossings is the increased risk for plugging and flood failure at undersized culverts.

Effects of Alternative 3 Specific to Occupied Bull Trout Habitat and Westslope Cutthroat Trout Habitat:

A direct effect of Alternative 3 would be the permanent closure of four fords located on roads 4100, 227-D1, 4104-A1/A2, 123-013 in bull trout occupied habitat to wheeled motorized vehicle use. This would eliminate the risk of direct mortality to the early life history stages of bull trout and WCT in Ontario Creek and the Little Blackfoot River from wheeled motorized vehicle traffic through fords. In upper Ontario Creek the ford (road 4104-A2) in bull trout habitat is currently closed and would remain permanently closed to wheeled motorized vehicle use. Therefore, risk for direct mortality to bull trout and WCT in the Little Blackfoot River and Ontario Creek as a function of wheeled motorized traffic through fords would be discountable under this alternative. Also, due to extremely low numbers of bull trout observed and documented in the latest FS and MDFWP electrofishing surveys between 2008 and 2012, risk of mortality to bull trout from wheeled motorized vehicle traffic across the Little Blackfoot River or Ontario Creek is considered to be very low.

Three other open fords in WCT habitat are located in Skelly Gulch east of the Divide (road 1853-A1), Sawmill Gulch (road 256), and an unnamed tributary to Ontario Creek (road 495-D1). The ford (and its associated high risk road) on Skelly Gulch would be closed having the direct effect of eliminating wheeled motorized traffic through WCT habitat in Skelly Gulch. The indirect effect would be the minimization of chronic sediment delivery into WCT habitat and the protection of incubating WCT embryo and fry from direct mortality due to wheeled motorized traffic through the streambed. In Sawmill Gulch and the unnamed Ontario tributary, proposed mitigation to protect WCT would be the closing of the two fords until an approved AOP compliant structure sized to pass 100-year flood flows could be installed. This would have the indirect effect of preventing potential direct mortality of WCT fry and eggs and reducing sedimentation from wheeled motorized traffic through the creek bed until an approved AOP compliant replacement crossing is installed.

Four dispersed campsites accessed by non-system road 123-013 and two other dispersed campsites accessed by road 227-E1, which extends beyond Kading Campground, would close as

a direct effect of closing these roads. Additionally, Alternative 3 would close the large ford on road 4100 including 1.4 miles of road 4100 and the ford at the Larabee. This would have the direct effect of eliminating the concentrated recreation activity along the banks of the Little Blackfoot River next to the dispersed campsites and the indirect effect of passive re-vegetation on disturbed ground adjacent the Little Blackfoot River. Tools to accomplish road and crossing closures would follow in a separate implementation plan for the Divide travel planning area.

The overall direct effect on WCT drainages in the planning area would be the elimination of wheeled motorized traffic travel on 0.67 miles of *high risk* road in one WCT drainage east of the Divide and approximately 7.0 miles of *high risk* road in eight WCT drainages west of the Divide. The WCT drainage east of the Divide that would benefit is Skelly Gulch where approximately 0.4 miles of hydrologically connected road and an active ford would be closed. Greenhorn Creek is questionable whether it still contains WCT based on the latest findings by FS and MDFWP fisheries crews. This drainage would experience the direct effect of having 2.8 miles of high risk road including nine crossings closed to wheeled motorized traffic. The indirect effect of these closures on fish habitat is the long-term trend of reduced sedimentation into the surface water system of fourteen sub-watersheds that support fish populations in the planning area.

In the interim, the indirect effect of closing the most high risk roads and crossings is that risk for plugging and flood failure at undersized culverts may increase due to an anticipated reduction in road surveillance and maintenance. It likely would be necessary to pull culverts on roads closed permanently to wheeled motorized vehicle use to effectively eliminate this risk and restore drainageways.

Effects of Alternative 3 Specific to Western Pearlshell Mussel Habitat

Effects of Alternative 3 on western pearlshell mussels or habitat are the same as those under Alternative 2 based on rationale provided that discusses potential affects to western pearlshell mussels.

Irreversible and Irretrievable Commitments

There is no irreversible commitment or permanent loss of future options in regards to the existing road system under Alternative 3. It remains doable for any FS road, whether closed or opened that is adversely affecting water quality, stream function, TES fish habitat or public safety, to be removed or relocated under a separate decision so that stream processes can be restored which would be beneficial to water quality and fish populations.

There would be an irretrievable (temporary) commitment of resources in the matter of ongoing road sediment delivery to fish-bearing habitat as a result of some road locations resulting in a direct surface flow path (hydrologic connection) to planning area streams. Approximately 8.2% of the existing transportation system consists of FS *high risk roads* and associated FS *stream-road intersections* that can cause an irretrievable commitment or temporary loss of fish habitat quality restorable by eliminating or relocating the roads. High risk roads represent an ongoing cumulative effect when left untreated, which would continue to diminish the reproductive capability of fish habitat within the planning area.

Under-designed culverts present an ongoing risk for releases of substantial stores of sediment in the form of roadfills at culvert crossings and potential barriers to fish migration. Culverts at risk that have not been removed or upgraded with AOP-compliant ones designed to pass 100-year floods impose an irretrievable commitment upon stream-riparian dependent fisheries until upgrades with AOP-compliant crossings that pass 100-year flood flows.

Cumulative Effects

Past, present, and reasonably foreseeable future non-road actions applicable to the Divide travel planning area are addressed in Appendix C. As an ongoing effect, Tables 3.26 and 3.27 in the Affected Environment section provide a quantitative overview of all stream-road intersections and miles of high risk roads in each 6th field HUC encompassed by the Divide travel planning area. Both tables refine the two road measures by outlining the amounts currently open versus closed for each sub-watershed.

There are approximately 719 miles of road in the planning area with about 78.4 miles considered *high risk roads* that lead to chronic excessive sediment delivery to the surface water system, fragment stream habitat, and/or alter stream-floodplain functions. The Forest Service maintains jurisdiction on about 58.6 miles of *high risk* roads. Under action Alternative 3, about 27.98 miles of high risk FS roads would be open and 30.66 miles (17.32 miles currently closed plus 13.34 proposed miles) or 52% would be closed to wheeled motorized vehicle use. Private and county roads account for balance of *high risk* roads or about 19.8 miles; these non-FS roads represent an ongoing cumulative effect to the surface water system in the planning area.

With approximately 378 *stream-road intersections* (crossings) in the planning area, the Forest Service has jurisdiction on 288 crossings. About 142 FS crossings (49%) would be closed under this alternative. Stream crossings are principal access sites for road sediment into the stream system. Due to their presence in the various planning area drainages, chronic road sediment delivery and physical alteration of stream habitat would remain an ongoing cumulative effect on fish habitat in the planning area that would be substantially reduced under an implementation plan that removes closed crossings (and mitigates open crossings).

Additionally, nine FS dispersed campsites associated with high risk roads are directly adjacent TES fish habitat, and six of these would close under this alternative. The other three dispersed recreation campsites would remain open to public users and continue to adversely affect TES fish habitat without mitigations. Six currently open fords on TES fish streams would experience permanent or temporary closures to reduce risk of direct mortality to WCT and bull trout. A seventh closed ford located in Ontario Creek would remain closed to wheeled motorized traffic. The physical presence of these fords would continue risking ongoing sediment delivery to TES fish habitat until measures under an implementation plan could replace the fords or rehabilitate crossings proposed for closure in this alternative.

In non-fishbearing streams, a ford on an unnamed tributary to the Little Blackfoot River above Kading Campground would be closed to wheeled motorized vehicle traffic leading to a long-term trend of eliminating or minimizing road sediment delivery downstream into inland native fish habitat.

Alternative 4

Direct and Indirect Effects

Alternative 4 has the direct effect of closing approximately 11.68 miles (20%) of FS *high risk* roads to motorized wheeled vehicle use in the planning area. Table 3.36 summarizes changes in the amount of open *high risk* roads for each 6th field HUC. Fourteen sub-watersheds would experience reductions in the miles of open *high risk* roads. The indirect effect of closing high risk roads is the potential for substantial reductions in long-term sediment delivery in planning area streams and increased opportunities to obliterate roadbeds that restore natural drainage and

stream habitat. Seven sub-watersheds would experience no change in the current open status of *high risk* roads so the indirect effect in these drainages reflects the No Action alternative in terms of sediment delivery risk.

Ontario Creek (west of the Divide) is the one drainage that would experience a net increase in open *high risk* roads from their current levels as a direct effect of this alternative (Table 3.36). An additional 0.28 miles of *high risk* road opened to wheeled motorized vehicle use is a result of proposals to open closed road # 4104-A2 in Ontario Creek.

Alternative 4 also has the direct effect of closing a net total of approximately 42 stream crossings to motorized wheeled vehicle use in the planning area. Table 3.37 summarizes changes in the amount of open *stream route intersections* in each sub-watershed. Thirteen drainages would experience a reduction in open stream crossings. The indirect effect would be the potential for substantial reductions in long-term sediment delivery and increased opportunities to remove crossing structures to restore natural drainage and stream habitat. Eight sub-watersheds would experience no change in the current open status of stream crossings so the indirect effect in these drainages reflects the No Action alternative in terms of sediment risk and opportunity in restoring drainage.

Ontario Creek is the only drainage in the planning area that would undergo an increase in crossings open to wheeled motorized vehicle use from their current levels as a direct effect of this alternative (Table 3.37). Two additional open crossings include a ford on Ontario Creek that would be the result of proposals to open closed roads 4104-A1/A2 and 495-A3 in Ontario Creek drainage. The indirect effect of opening these closed crossings to wheeled motorized use is increased risk of sediment delivery to Ontario Creek and direct mortality of bull trout and WCT early life stages. To protect TES fish and habitat from wheeled vehicle access at these crossings, they would be temporarily closed until a bridge or other AOP-compliant bottomless structure would be installed under a mitigation plan intended to protect water quality and native species. This reduces the risk of direct mortality to the early life history stages of bull trout and WCT in Ontario Creek.

Table 3.36 Miles and net changes on **open** FS *high risk roads* (miles) by watershed

6th Field HUC	Alt 1	Alt 4	Net change
Upper Tenmile Cr	4.35	4.30	-0.05
Middle Tenmile Cr	2.35	0.98	-1.37
Lower Tenmile Cr	0.85	0	-0.85
Greenhorn Cr	3.55	0.74	-2.81
Skelly G	0.95	0.28	-0.67
Upper Silver Cr	0.60	0	-0.60
Iron Horse Cr	1.41	1.41	0

Table 3.37 Numbers and net change on FS **open** *stream-road intersections* by watershed

6th Field HUC	Alt 1	Alt 4	Net change
Upper Tenmile Cr	20	20	0
Middle Tenmile Cr	18	9	-9
Lower Tenmile Cr	4	0	-4
Greenhorn Cr	13	4	-9
Skelly G	2	1	-1
Upper Silver Cr	2	0	-2
Iron Horse Cr	7	7	0

Ontario Cr	1.64	1.92	+0.28
L.Blackfoot-Larabee	1.84	0.94	-0.90
Telegraph Cr	5.03	4.11	-0.92
Mike Renig Cr	0	0	0
Upper Dog Cr (N)	6.73	4.50	-2.23
Lower Dog Cr	0.84	0.73	-0.11
L.Blackfoot-Hat Cr	1.85	1.36	-0.49
North Trout Cr	2.98	2.98	0
Snowshoe Cr	3.76	3.29	-0.47
L.Blackfoot-Elliston	0.74	0.74	0
Carpenter Cr	0.79	0.79	0
Trout Cr	0.09	0.09	0
So.Fork Dog Cr	0.12	0	-0.12
Upper Dog Cr (S)	0.85	0.48	-0.37
Threemile Cr	0	0	0
Total:	41.32	29.64	-11.68

Ontario Cr	10	12	+2
L.Blackfoot-Larabee	4	3	-1
Telegraph Cr	29	26	-3
Mike Renig Cr	0	0	0
Upper Dog Cr (N)	39	34	-5
Lower Dog Cr	4	3	-1
L.Blackfoot-Hat Cr	8	3	-5
North Trout Cr	10	10	0
Snowshoe Cr	10	9	-1
L.Blackfoot-Elliston	3	3	0
Carpenter Cr	5	5	0
Trout Cr	1	1	0
So.Fork Dog Cr	1	0	-1
Upper Dog Cr (S)	4	2	-2
Threemile Cr	0	0	0
Total:	194	152	-42

Effects of Alternative 4 Specific to Occupied Bull Trout Habitat and Westslope Cutthroat Trout Habitat:

A direct effect of Alternative 4 would be the permanent closure of one ford (road 123-013) and the temporary closures of three other fords (roads 4100, 227-D1, 4104-A1A2) located in bull trout occupied habitat to wheeled motorized vehicle use. This would eliminate the risk of direct mortality to the early life history stages of bull trout and WCT in Ontario Creek and the Little Blackfoot River from wheeled motorized vehicle traffic through fords. Also, due to extremely low numbers of bull trout observed and documented in the latest FS and MDFWP electrofishing surveys between 2008 and 2012, risk of mortality to bull trout from wheeled motorized vehicle traffic in the Little Blackfoot River or Ontario Creek is considered to be very low.

Three other open fords in WCT habitat are located in Skelly Gulch east of the Divide (road 1853-A1), Sawmill Gulch (road 256), and an unnamed tributary to Ontario Creek (road 495-D1). The ford (and its associated high risk road) on Skelly Gulch would be closed having the direct effect of eliminating wheeled motorized traffic through WCT habitat. The indirect effect would be the minimization of chronic sediment delivery into WCT habitat and the protection of incubating WCT embryo and fry from direct mortality due to wheeled motorized traffic through the streambed. Other fords located in WCT habitat (Sawmill Gulch, unnamed Ontario tributary) would have proposed mitigation to protect WCT that closes the fords until an approved AOP compliant structure sized to pass 100-year flood flows could be installed. This would have the indirect effect of preventing potential direct mortality of WCT fry and eggs and reducing

sedimentation from wheeled motorized traffic through the creek bed until an approved AOP compliant replacement crossing is installed.

Four dispersed campsites accessed by non-system road 123-013 and two dispersed campsites accessed by road 227-E1 would be closed to wheeled motorized access as a direct effect of closing these roads. This would have the direct effect of eliminating concentrated recreation activity along the banks of the Little Blackfoot River next to the dispersed campsites with the indirect effect of passive re-vegetation on disturbed ground adjacent the Little Blackfoot River.

The overall direct effect on WCT drainages in the planning area would be the elimination of wheeled motorized traffic travel on 0.67 miles of *high risk* road in one WCT drainage (Skelly Gulch) east of the Divide and approximately 5.6 miles of *high risk* road in eight WCT drainages west of the Divide. In Skelly Gulch approximately 0.4 miles of hydrologically connected road and an open ford would be closed as a direct effect of this alternative. Greenhorn Creek remains questionable in terms of WCT present in that drainage based on the latest findings by FS and MDFWP fisheries crews. This drainage would experience the direct effect of having 2.8 miles of high risk road including nine crossings closed to wheeled motorized traffic. The indirect effect of all closures on fish habitat is the long-term trend of reduced sedimentation into the surface water system of fourteen sub-watersheds that support fish populations in the planning area.

In the interim, the indirect effect of closing the high risk roads and crossings under this alternative remains to be the increased risk for plugging and flood failure at undersized culverts due to an anticipated reduction in road surveillance and maintenance. It likely would be necessary to pull culverts on roads closed permanently to wheeled motorized vehicle use to effectively eliminate this risk and restore drainageways.

Alternative 4 (like Alternative 3) would permanently close to wheeled motorized vehicles the existing open road 227-E1 that extends beyond Kading Campground. Consequently, 0.6 miles of high risk road including one ford crossing and two high risk dispersed campsites associated with this road would be closed. The indirect effect of this proposal is the reduced risk for adverse effects upon inland native fish habitat in the Little Blackfoot River.

Effects of Alternative 4 Specific to Western Pearlshell Mussel Habitat

Effects of Alternative 4 on western pearlshell mussels or habitat are the same as those under Alternative 2 based on rationale provided that discusses potential affects to western pearlshell mussels (see page 37).

Irreversible and Irretrievable Commitments

There is no irreversible commitment (permanent loss) of future options in regards to the existing road system under Alternative 4. Any FS road, closed or opened, that is adversely affecting water quality, stream function, TES fish habitat or public safety, could be removed or relocated under a separate decision so that stream processes can be restored which would be beneficial to water quality and fish populations.

There would be an irretrievable (temporary) commitment of resources in the matter of ongoing road sediment delivery to fish-bearing habitat due to some road locations having a direct surface flow path (hydrologic connection) to planning area streams. Approximately 8.2% of the existing transportation system consists of FS *high risk roads* (and associated FS *stream-road intersections*) that can cause an irretrievable commitment or temporary loss of fish habitat quality restorable by eliminating or relocating the roads. High risk roads represent an ongoing

cumulative effect when left untreated, which would continue to diminish the reproductive capability of fish habitat within the planning area.

Under-designed culverts present an ongoing risk for releases of substantial stores of sediment in the form of roadfills at culvert crossings and potential barriers to fish migration. Culverts at risk that have not been removed or upgraded with AOP-compliant ones designed to pass 100-year floods impose an irretrievable commitment upon stream-riparian dependent fisheries until upgrades with AOP-compliant crossings that pass 100-year flood flows.

Cumulative Effects

Past, present, and reasonably foreseeable future non-road actions for the Divide travel planning area can be found in Appendix B. For roads, Tables 3.26 and 3.27 in the Affected Environment section provide a quantitative overview of all *stream-road intersections* and miles of *high risk roads* in each 6th field HUC as an ongoing effect of the transportation system in the Divide travel planning area. Both tables refine the two road measures by outlining the amounts currently open versus closed for each sub-watershed.

There are approximately 719 miles of road in the planning area and about 78.4 miles are considered *high risk roads* that lead to chronic excessive sediment delivery to the surface water system, fragment stream habitat, and/or alter stream-floodplain functions. The Forest Service maintains jurisdiction on about 58.6 miles of *high risk* roads. Under action Alternative 4, about 29.64 miles of high risk FS roads would be open and 29.0 miles (17.32 miles currently closed plus 11.68 proposed miles) or 49.5% would be closed to wheeled motorized vehicle use. Private and county roads account for the balance of *high risk* roads or about 19.8 miles; these non-FS roads represent an ongoing cumulative effect in the form of excess sediment to the surface water system in the planning area

With about 378 *stream-road intersections* (crossings) in the planning area, the Forest Service has jurisdiction on 288 crossings, and 136 FS crossings (47%) would be closed under this alternative. Stream crossings are principal access sites for road sediment into the stream system. Crossings are access points for chronic road sediment delivery and physical alteration of stream habitat and would remain an ongoing cumulative effect on fish habitat in the planning area that would be substantially reduced under an implementation plan that removes closed crossings (and mitigates open crossings).

Additionally, nine FS dispersed campsites associated with high risk roads are directly adjacent TES fish habitat, and six of these would be closed to wheeled motorized access under this alternative. Three dispersed recreation campsites would remain open to public users and continue to adversely affect TES fish habitat without mitigations. Six fords currently open on TES fish streams would experience permanent or temporary closures to reduce risk of direct mortality to WCT and bull trout. A seventh closed ford located in Ontario Creek would remain closed to wheeled motorized traffic. The physical presence of these fords would continue risking ongoing sediment delivery to TES fish habitat until measures under an implementation plan could replace the fords or rehabilitate crossings proposed for closure in this alternative.

In non-fishbearing streams, a ford on an unnamed tributary to the Little Blackfoot River above Kading Campground would be closed to wheeled motorized vehicle traffic leading to a long-term trend of eliminating or minimizing road sediment delivery downstream into inland native fish habitat.

Conclusions

The Divide travel planning area (planning area) overlaps 22 sub-watersheds, and approximately 719 miles of roads occur within the planning area. The Forest Service (FS) has jurisdiction over the majority of these roads, but a substantial portion of roads fall under non-FS (private or county) jurisdiction. This report examines only the FS roads as various segments of FS roads in the planning area are being proposed to be closed to wheeled motorized vehicle use while a few others would be opened as compared to baseline conditions (No Action).

Another element of the Divide travel plan relates to over-snow travel typically for motorized winter recreation. Motorized over-snow traffic would also realize some area and route changes compared to baseline conditions in the planning area. Because ground conditions for this type of recreation or travel activity are frozen and covered with snow, motorized over-snow travel (namely with snowmobiles) is assumed to have no sediment risk to streams. Therefore, this component of travel planning was dismissed from consideration as a potential effect to streams and fish habitat.

Research shows that fine sediment exceeding natural background levels is a stressor to aquatic organisms like trout that depend on clean stream gravels for their reproductive strategy. Most roads in the planning area are located away from the stream network so that road sediment does not become a risk to the surface water system. Therefore, this report filters out only those FS road segments that parallel or bisect streams. Two measures to evaluate these road elements used in this analysis were *high risk roads* within 300 feet of streams and *stream-route intersections* (*crossings*).

Closing these two road elements has the direct effect of eliminating motorized vehicle traffic (and road maintenance) on the roadbed and indirectly allows exposed road surfaces to re-vegetate in the long run reducing sediment delivery to nearby streams. Currently there are approximately 58.6 miles of high risk roads and 288 crossings under FS jurisdiction throughout the planning area. Under No Action 17.3 miles (30%) of high risk roads and 94 (33%) of the crossings are currently closed to wheeled motorized vehicle travel.

Three action alternatives would propose additional road closures in the planning area for which high risk roads and crossings would be removed from wheeled motorized vehicle use thereby helping to reduce adverse effects on water quality and fish habitat. These action alternatives have different levels of road closures by alternative as shown in Table 3.38 below.

Table 3.38 Divide Travel Planning Area Road Closure Changes By Alternative.

Alternative	Forest Service				Non-Forest Service	
	High Risk Roads (miles)		Stream Crossings (no.)		High Risk Roads (miles)	Stream Crossings (no.)
	Open	Closed	Open	Closed		
One (No Action)	41.3	17.3	194	94	19.7	90
Two	33.8	24.8	180	108	19.7	90
Three	28.0	30.6	146	142	19.7	90
Four	29.6	29.0	152	136	19.7	90

The general forestwide standards for fisheries are met by the action alternatives as the project was closely coordinated with fisheries staff in the planning process. None of the alternatives involve road construction or reconstruction so standards for instream activities or structures do not apply, except under cumulative effects activities where all work in streams has been closely coordinated with fisheries and the State to ensure spawning habitats remain accessible and are not adversely affected by sediment. Road maintenance is covered in accordance with direction provided in the Transportation System Maintenance Handbook and special measures provided under the 1999 Programmatic Biological Assessment for Road Maintenance (MT Bull Trout Level 1 Team).

Alternative 3 is the action alternative that would move the planning area toward consistency with the Inland Native Fish Strategy (INFISH) amendment to the Forest Plan most aggressively because it would result in the closure of 30.6 miles (52%) of high risk FS roads including 142 (49%) crossings in the planning area. This amounts to the most of all alternatives. INFISH standards RF-2c and RF-3c are being met by development of this Travel Management Plan and by prioritizing which roads to be closed based on the direction to avoid adverse effects to inland native fish. Five fords located directly in occupied TES fish habitat would be permanently closed under this alternative, and two others would be temporarily closed till replaced with AOP compliant structures sized for 100 year flood flows. Additionally, this alternative would close six (of nine) dispersed recreation campsites from access by wheeled motorized vehicles having adverse effects on native fish habitat adjacent to the campsites. The recreation management standards RM-1 and RM-2 are met with this alternative as most sites having adverse effects on native fish habitat would be closed and the other three sites would be identified for adjustments to avoid adverse effects on fish habitat. Thus, this alternative is highly effective at eliminating risk of direct mortality on TES fish and reducing habitat disturbance from fords and dispersed camping activity in the planning area.

Alternative 4 would also move the planning area toward consistency with the INFISH amendment aggressively because it would result in the closure of 29 miles (49.5%) of high risk FS roads and 136 (47%) crossings in the planning area. The INFISH standards RF-2c and RF-3c are being met by development of this Travel Management Plan and by prioritizing roads to be closed based on the direction to avoid adverse effects to inland native fish. Two fords located directly in occupied TES fish habitat would be closed permanently under this alternative and the five other fords closed temporarily until replaced with AOP compliant structures sized for 100 year flood flows. Additionally, this alternative would close six (of nine) dispersed recreation campsites currently having adverse effects on native fish habitat adjacent to the campsites. Recreation management standards RM-1 and RM-2 are met with this alternative as most sites having adverse effects on native fish habitat would be closed and the other three sites identified for adjustments to avoid adverse effects on fish habitat. Thus, this alternative becomes highly effective at eliminating risk of direct mortality on TES fish and reducing habitat disturbance from fords and dispersed camping activity in the planning area.

Alternative 2 moves the planning area toward consistency with the INFISH amendment but at a reduced pace compared to other action alternatives as it would result in the closure of 24.8 miles (42%) of high risk FS roads and 108 (37%) crossings in the planning area. The INFISH standards RF-2c and RF-3c are being met by development of this Travel Management Plan and by prioritizing roads to be closed based on the direction to avoid adverse effects to inland native fish. Two fords located directly in occupied TES fish habitat would be closed permanently under this alternative and the five other fords closed temporarily until replaced with AOP compliant

structures sized for 100 year flood flows. Additionally, this alternative would close four (of nine) dispersed recreation campsites currently having adverse effects on native fish habitat adjacent to the campsites. Recreation management standards RM-1 and RM-2 are met as four sites having adverse effects on native fish habitat would be closed and the other five sites identified for adjustments to avoid adverse effects on fish habitat. This alternative therefore helps to eliminate risk of direct mortality on TES fish and reduce habitat disturbance from fords and dispersed camping activity.

The No Action Alternative (existing condition) would maintain the current level of 17.3 miles of high risk roads and 94 crossings closed to wheeled motorized vehicles while 41.32 miles and 194 crossings stay open. This meets general forestwide standards since the project was closely coordinated with fisheries staff in the planning process, and there are no proposals for road construction or reconstruction so standards for instream activities or structures do not apply. The No Action alternative, however, would fall short of INFISH standards RF-2c and RF-3c as there would be no effort to move the transportation system forward to avoid ongoing adverse effects to inland native fish.

The Divide travel planning area has over 140 miles of fish-bearing streams throughout 21 of 22 sub-watersheds within the planning area. The fish assemblage consists of a mix of native and non-native species. Non-native brook trout and rainbow trout account for 96% of the fishery in the upper Missouri River side of the planning area, and non-native brown trout and brook trout comprise about 65% of the fishery in the Upper Clark Fork River basin side of the planning area. Native salmonids include WCT both sides of the Divide and bull trout occur only west of the Divide in the planning area. Other native fish present in the planning area include mountain whitefish, longnose suckers and sculpins. Westslope cutthroat trout are designated a *Sensitive Species* by the Northern Region of the US Forest Service and are the fish "management indicator species" on the Helena NF. Bull trout are listed as "threatened" under the Endangered Species Act (ESA) of 1973. An aquatic invertebrate, western pearlshell mussels, was added to the sensitive species list in June, 2011, and are therefore considered for potential effects from this project.

The existing road system in the planning area has sufficient miles of high risk roads and crossings to risk negative effects on native inland fish as evidenced by the two measures to evaluate effects of the alternatives. The non-forest roads (Table 3.38) represent an ongoing road use activity under cumulative effects outside Forest Service control. A Biological Evaluation/Assessment is needed to satisfy requirements of the Forest Service Manual (FSM) at FSM 2672.4 to review FS actions for possible effects to listed, proposed, or sensitive species. To that end, projected effects to the federally listed bull trout, the sensitive westslope cutthroat trout and sensitive western pearlshell mussel have been summarized in the table below. A biological evaluation for sensitive WCT and western pearlshell mussel will be completed for the preferred alternative. Because of adverse baseline conditions to listed bull trout habitat, formal consultation via a bull trout assessment will be prepared and submitted to the U.S. Fish & Wildlife Service.

Table 3.39 Effects projected for Bull Trout, Westslope Cutthroat Trout and Western Pearlshell Mussel Habitat Common to all Alternatives.

Fish Species and Habitat	Ongoing Effect of Current Transportation System Common to All Alternatives[1]
Bull Trout	May Affect, Likely to Adversely Affect bull trout based upon magnitude of road hazard indicators in the most impacted 6th field HUCs with bull trout west of the Continental Divide.
Westslope Cutthroat Trout	May Impact Individuals, but will not likely contribute to a trend toward federal listing or loss of viability of the population or species for populations both sides of the Continental Divide.
Western Pearlshell Mussel	No Effect based on lack of western pearlshell occurrences and predicted habitat west of the Divide, and unlikelihood for a change in habitat in lower Tenmile Creek east of the Divide from slight potential changes in sediment delivery from any adjustments in open/closed status of roads.

[1] Effect determination on TES aquatic species and habitat based on determination for most impacted 6th field HUCs in Divide Travel area.

Forest Plan Consistency

A reasonably foreseeable federal action under all alternatives is the additional review of roads to determine which segments on both open and closed roads are having adverse effects to inland native fish habitat prerequisite to developing a plan to minimize those effects. This future federal action moves the Forest closer in meeting the intent of avoiding adverse effects to inland native fish and fish habitat.

Alternative 1, No Action

Numerous road segments and crossings that have risks for inland native fish and fish habitat are quantified in Tables 3.26 and 3.27 and would remain open under the No Action Alternative. Even with future reviews on roads having adverse effects to streams to help determine what actions are needed to avoid adverse effects on native fish and habitat, the No Action Alternative results in the slowest pace in meeting the Forest Plan amendment for avoiding adverse effects on fisheries. This is because No Action would close no roads and crossings adversely affecting fish habitat as a tool considered most effective at removing sediment sources in the long term.

Alternative 2

There are 7.46 miles of FS high risk roads and 14 FS stream crossings that risk adverse effects to native fishes and fish habitat being proposed for closure under Alternative 2, which would incrementally move the Forest forward in fully meeting the intent of the Forest Plan amendment compared to the No Action Alternative. A few currently closed roads and crossings would be opened to wheeled motorized use under this alternative potentially increasing risk for adverse effects to native fishes and fish habitat. To maintain consistency with the Forest Plan, an element common to all action alternatives is that opened fords would be closed to wheeled motorized vehicles until appropriate mitigation measures are in place that would minimize or eliminate ongoing adverse effects from high risk roads and wheeled motorized use through fords.

Alternative 3

There are 13.34 miles of FS high risk roads and 48 FS stream crossings that risk adverse effects to native fishes and fish habitat being proposed for closure under Alternative 3. This alternative most aggressively would move the planning area toward consistency with INFISH amendments to the Forest Plan. This alternative would leave the least amount of open high risk roads and crossings having adverse effects to native fishes and fish habitat, and moves the planning area forward at the most rapid pace to fully meet the intent of the INFISH amendments. To maintain consistency with the Forest Plan, an element common to all action alternatives is that opened fords would be closed to wheeled motorized vehicles until appropriate mitigation measures are in place that would minimize or eliminate ongoing adverse effects from high risk roads and wheeled motorized use through fords.

Alternative 4

There are 11.68 miles of FS high risk roads and 42 FS stream crossings that risk adverse effects to native fishes and fish habitat being proposed for closure under Alternative 4. This alternative would move the planning area toward consistency with INFISH amendments to the Forest Plan nearly as aggressively as action Alternative 3. Although this alternative would leave open some high risk roads and crossings having adverse effects to native fishes and fish habitat, it would move the planning area substantially forward to fully meet the intent of the INFISH amendments. To maintain consistency with the Forest Plan, an element common to all action alternatives is that opened fords would be closed to wheeled motorized vehicles until appropriate mitigation measures are in place that would minimize or eliminate ongoing adverse effects from high risk roads and wheeled motorized use through fords.

WILDLIFE

Introduction

The Divide landscape of the Helena National Forest (HNF) supports a diverse assemblage of wildlife populations typical of most National Forests in the northern Rockies. While the landscape encompasses numerous blocks of habitat in which human presence is fleeting and slight, roads and trails have been a prevalent feature of this landscape since the mid-late 19th century. Roads and motor trails concentrate human activity and harbor the potential to influence wildlife species and their habitats in a variety of ways. Wildlife response to roads can be highly variable depending on the inherent reaction of the species to human influences; the character, severity, and longevity of the road impacts; the habitat context; the time of year; and so on. Wildlife may respond by avoiding, habituating, or being attracted to roads.

The Environmental Impact Statement (EIS)[2] for the Divide travel plan presents four alternatives:

- *Alternative 1* would retain the Existing Condition, with 431 miles of Forest, County, and private roads; 35 miles of trails available to public use via wheeled motor vehicles during all or part of the year (16 miles of which are currently unauthorized); and 425 miles of snowmobile routes.

[2] A glossary of acronyms and initialisms used in this report can be found on page 271

- *Alternative 2* would support approximately 429 miles of open Forest, County, and private access roads; 28 miles of motor trails; and 409 miles of snowmobile routes.
- *Alternative 3* would put more emphasis on non-motorized routes and would support approximately 390 miles of open Forest, County, and private access roads; no authorized motor trails; and 407 miles of snowmobile routes.
- *Alternative 4* is a modified version of Alternative 3—with 399 miles of open Forest, County, and private access roads; 4 miles of authorized motor trails; and 398 miles of snowmobile routes.

These mileages include 118 miles of County and private access roads open to the public within National Forest administrative boundaries. These roads remain open under all alternatives.

The travel plan deals with Helena National Forest (HNF) lands in the Divide landscape of the Helena Ranger District (HRD). Not included are the Clancy-Unionville implementation area in the southeastern part of the landscape and most of the Little Prickly Pear drainage in the northern end, both of which have been covered by earlier travel planning efforts (Clancy-Unionville Vegetation Manipulation and Travel Management Project, 2003; Sound Wood Salvage Project, 1998). This report describes the current environment for terrestrial wildlife species in the Divide landscape with an emphasis on the influence of the existing road and trail network. It then examines the expected response of wildlife communities to each of the four proposed alternatives. The following components are addressed:

- General Habitat—including Old-Growth Forest
- Riparian Habitats
- Connectivity –Habitat Fragmentation, Movement Corridors, and Linkage Zones
- Snags and Woody Debris
- Big Game Species
- Threatened, Endangered and Sensitive species (TES)
- Management Indicator Species (MIS)

The analysis has been minimized for species, groups of species, and habitat components for which the probability of a meaningful effect is very low. This includes some species and habitat elements that would typically be analyzed in timber harvest and prescribed burning projects. These species and components are addressed, but not at length. They would experience few, if any, direct effects from the kind of travel management proposed here. Quantitative analysis is reserved for species and habitat elements that may be influenced in measurable ways by implementation of any of the alternatives proposed by this travel planning effort. In some cases, detailed discussion of indicator species (such as elk) serves as a surrogate for other potentially affected species (such as mule deer) that are addressed in less detail.

A proposed programmatic big game security Forest Plan amendment is a component of this analysis. It has been described in Chapter 2 and in more detail below and in AppendixD. By law, proposed actions must be consistent with the Forest Plan or the Plan must be changed. Amendments to the Forest Plan can have effects because they propose changes in the management of the forest.

Regulatory Framework

National Forest Management Act

The Forest Service is charged with maintaining the viability of all existing native and desired non-native vertebrate species in a planning area under the National Forest Management Act of 1976 (NFMA) (36 CFR 219.19). A forest plan must identify "management indicator species" (MIS) that serve as proxies for fulfilling this NFMA viability requirement [see *Helena Forest Plan* (1986) page II/17]. The regulations impose a standard by requiring development of habitat objectives for maintaining viability of MIS throughout a planning area.

Forest Service Manual

The *Forest Service Manual (FSM)* provides direction for the management of terrestrial resources. *FSM* 2630 provides overall objectives for maintaining and improving wildlife habitat. Section 2670 establishes objectives and procedures for managing and protecting threatened, endangered, and sensitive species.

Helena Forest Plan

The *Helena Forest Plan (HFP),* developed in the early 1980s and released in 1986, sets the framework for management of wildlife species. Forest-wide standards and guidelines for wildlife are identified on pages II/17 – II/21. In addition, the standards incorporate more detailed direction for elk and grizzly bears in Appendices C, D, and E. The standards and guidelines are applied to all alternatives in the following analysis as appropriate.

Endangered Species Act

The Endangered Species Act (ESA) of 1973 requires all Federal agencies to review any project authorized, funded, or carried out to ensure that the action is not likely to jeopardize continued existence of any proposed, threatened, or endangered species. This is documented in a biological assessment for those listed or proposed species present in the planning area. In cases where the assessment determines that a proposed action *may affect* a listed or proposed species, the ESA requires consultation with and concurrence from the U.S. Fish and Wildlife Service (USFWS) before a decision can be signed. The *Biological Assessment* for terrestrial wildlife species in the Divide travel planning area has been prepared as a separate document. The *Biological Evaluation* of threatened, endangered, and sensitive (TES) species is a requirement of Forest Service policy and is included within this report.

National Environmental Policy Act

The National Environmental Policy Act of 1969 requires that all environmental analyses consider a full range of reasonable alternatives to the proposed action--alternatives that address the principal issues and meet the purpose and need for the proposed action. For the Divide travel plan, three alternatives are presented in an *Environmental Impact Statement (EIS)*.

The primary purpose of the *Wildlife Specialist Report*, then, is to review in detail the potential effects of the alternatives on the wildlife environment. These findings are presented in more abbreviated form in the *Environmental Impact Statement* and are used to shape the final decision (to be presented in a *Record of Decision)*).

Assumptions, Information Used, and Methodology & Scientific Accuracy (40 CFR 1502.15)

Table 3.40, which follows, summarizes the assumptions and methodologies used in the analysis of different alternatives. More detailed information as to the construction and application of habitat models for threatened, endangered, and sensitive species and for management indicator species (including elk) is included in the Project Record. More complete discussion of the resource issues introduced here comes in following sections.

Monitoring and Mitigation

Monitoring is documented in the Project Record. The following mitigation items apply:

- Any road may be consisered for appropriate seasonal closures if future monitoring indicates a need.
- Firewood retrieval will be addressed via the permit process.
- Road closure effectiveness will be monitored as described in the *Record of Decision* Monitoring Plan.

Table 3.40 Assumptions, information used, methodologies, and scientific accuracy applied to wildlife parameters

WILDLIFE PARAMETER	ASSUMPTIONS AND INFORMATION USED	METHODOLOGIES AND SCIENTIFIC ACCURACY
General Habitat	Information on wildlife and wildlife habitat in the Divide travel planning area has been extracted from 17 years of field survey work throughout the Divide landscape (1992-2010). Some of this information is summarized in the Divide Landscape Analysis (HNF 1996) and in environmental analyses conducted for a variety of projects across the landscape since 1992 [HRD/HNF files]. Recent modeling and mapwork by HNF GIS specialists has been used. This section focuses on the direct effects of roads on forest and grassland/shrubland habitat (habitat loss, fragmentation, edge effects). Effects on riparian and wetland sites are addressed in the section on "Riparian Habitat". Edge effects are described for roads but not for trails. This derives from the observation that most trails on the HNF are narrow tracks that produce little, if any measurable edge. That is, trails in forest habitat run under the canopy rather than scouring out a contrasting corridor through the surrounding habitat. As a result, edge effects associated with these narrow travelways are assumed to be negligible.	Because wildlife species composition in any given area is primarily a product of available habitats, most wildlife is discussed at the "coarse filter" scale. It was assumed that broad groups of similar vegetation will support similar arrays of wildlife species and levels of biodiversity (absent specific limitingfactors generated by human interference or natural factors). Likewise, it was also assumed that roads in each of these broad vegetation types will affect associated wildlife communities in similar ways. In some cases, individual species and their specific habitat needs are discussed—especially in the case of uncommon species dependent on particular habitat components for which data is available. This is a "fine filter" approach. Effects on general habitat are discussed in terms of habitat loss, fragmentation, and edge effects.
Old-Growth Forest	Information used to model old-growth is described in the documentation file created by HNF GIS specialists [Project Record]. Modeling is based on sampling for the timber stand data layer (part of the Master Vegetation Layer). Effects generated by roads in old growth forest are assumed to be similar	Direct effects of roads are discussed briefly with regard to fragmentation, habitat loss (particularly with regard to snags), and edge effects. These data are not quantified.

WILDLIFE PARAMETER	ASSUMPTIONS AND INFORMATION USED	METHODOLOGIES AND SCIENTIFIC ACCURACY
	to those that occur in forested habitat in general.	
Riparian Habitats	Information used to assess effects on riparian habitat is based on data summarized in the Fisheries and Watershed Specialist Report and analyses conducted by HNF GIS specialists. It was assumed that these assessments are sufficient to indicate effects on these focal habitat sites that are important not only to species of special concern (such as western toads) but to a wide variety of wildlife.	Methodologies for assessing effects of motorized use within the 300 foot riparian zone (Riparian habitat conservation Areas) are described in the Fisheries and Watershed reports. This analysis reports miles of open road expected in these riparian areas under different alternatives.
Connectivity: Dispersal, Migration, and Travel Corridors; Linkage Zones; Fragmentation	The size and distribution of habitat patches away from the influence of open roads is used as a general indicator for comparing differences among alternatives. Previous modeling efforts for portions of the Divide landscape (Walker and Craighead 1997; Olimb and Williamson 2006) to assess the general status of habitat connectivity in the travel plan area were used. Then changes in non-motorized patch size in specific areas where alternatives differed from one another to come up with a relative indicator were reviewed. It was assumed that the fewer and larger the unroaded patches, the better the connectivity (the less the fragmentation). Better connectivity may be partially a function of lower road density alone, but primarily it reflects patterns of open road dispersion (regardless of density) that allow ample blocks of wildlife habitat to function free from road influences.	Background concepts for estimating the relative quality of connectivity among alternatives are from (1) a model developed by Walker and Craighead (1997) and expanded upon by Olimb and Williamson (2006) and (2) the FS Region-1 Connectivity Protocol. The 2 habitat models focus on the needs of animals needing the largest corridors (grizzly bears, mountain lions, elk) and employ habitat suitability, habitat complexity, and weighted road density as key parameters. The Region-1 Protocol calculates the size and distribution of unroaded patches at least ½ mile from open roads, since research on several species (including elk and grizzly bears) indicates that ½ mile provides an adequate buffer. This assessment focuses on size and distribution of areas free from vehicle use. All unroaded and non-motorized patches larger than 1,500 acres are tallied, and changes between alternatives calculated. This gives a general sense of relative differences between alternatives—and

WILDLIFE PARAMETER	ASSUMPTIONS AND INFORMATION USED	METHODOLOGIES AND SCIENTIFIC ACCURACY
		of the potential effectiveness of the Continental Divide "linkage zone" or "movement corridor" for larger wildland species. Effectiveness of the linkage varies by species depending on their habitat needs, behavioral traits, and reaction to human presence. Lynx and marten, for example, prefer continuously forested environment, while grizzly bears and elk are best served by a mosaic of forested and unforested habitat.
Snags and Woody Debris	Primary information sources and assumptions are summarized in Bate and Wisdom (2002a, 2002b) and Hillis et al. (2003). Additional information and assumptions are described in the text files and analyses run by HNF GIS specialists [project file]. In analyzing woody debris, it was assumed that effects are qualitatively similar for all 3 alternatives since the 300-ft rule for off-road camping applies in each case, and opportunities for firewood cutting are similar.	Since no new roads would be constructed under any alternative, it was assumed that that there would be no direct effects from habitat loss. The methodology used to analyze indirect effects on snags and logs is described in "Analysis Methodology for Effects of Roads on Snags and Logs" in Appendix C. Indirect effects on snags and logs related to "edge" created by road prisms remaining on the landscape are described in the General Habitat section.
Motorized Use within 300-feet of Open Roads and Trails	The magnitude of impacts to wildlife and wildlife habitat from legal vehicle use within 300 feet of motorized routes is obviously tied to the miles of open road under any given scenario. These effects are also analyzed under "Riparian Habitat" and "Snags and Woody Debris". Analyses by HNF GIS specialists yielded road miles. Effects apply to all open motorized routes regardless of habitat type. Effects on riparian habitat are analyzed by Riparian Habitat Conservation Areas (RHCA) which are buffers along stream corridor areas that vary from 150 to	Open route miles ("open" to wheeled vehicles) are used to determine habitat effects generated by motorized use within 300-feet of the routes. Any road that is open at any time of the year is included as an open route. This does not include snowmobile activity.

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	300 feet wide on either side of streams.	
Elk	Elk herd units (EHUs) were delineated by Helena National Forest (HNF) and Montana Fish, Wildlife and Parks (MFWP) biologists in 2003 and modified in 2007 and 2011. Herd units extend 1.5 mi beyond HNF boundaries, which we assume accounts for the area used by most elk that regularly move on and off the Forest in winter. Assessment of the impacts of roads on elk are based on the road attribute layers for each alternative. With the exception of one herd unit, Summer range is assumed to be synonymous with the entire herd unit (though this is often an overestimation). Hiding cover—which underlies the Forest Plan standard for elk summer range quality—is based on modeling by HNF GIS analysts (USDA 2009). The HNF uses the MT Fish, Wildlife and Parks definition of hiding cover, which assumes that forest crown closure of 40% or more is an indicator of hiding cover. To delineate Forest Plan winter range, maps developed for the HNF Oil and Gas Leasing EIS (1995) were used. Plots of several thousand winter elk locations (from MFWP aerial surveys and radio-telemetry) were compared to 3 available winter range maps—"Forest Plan" (1981-86),"Oil and Gas" (1995), and MFWP (1999-2010). The "Oil and Gas" map covered 96% of winter elk locations within herd units. The more broadly defined MFWP winter ranges were used when discussing elk habitat use	Methodologies used to determine direct and indirect effects on elk include the following: Summer Habitat Effectiveness (Christensen et al. 1993) is based on open road density within each elk herd unit (including private roads) between May 16 and Sept. 30. Road locations and vehicle use patterns have been verified on the ground to the extent possible. Modeling of hiding cover (for Forest Plan compliance) provides a reasonably accurate estimate of % cover over broad areas, but it is not useful for drawing local, site-specific conclusions as to elk habitat use. Crown closure, estimated from satellite imagery, served as a surogate for measuring hiding cover directly on the ground. Effects of travel management on winter range are based on open road and snowmobile trail patterns on "HNF Oil and Gas EIS winter range" within HNF boundaries and on "MFWP winter range" in the 1.5 mile herd unit extension beyond those boundaries. Assessment of snowmobile use comes from the most recent Forest snowmobile trail maps and verification from discussion with local snowmobile groups that regularly use the trail system. Elk vulnerability during the hunting season is based on the percentage of fall home range occupied by effective elk security areas. Security areas were initially delineated via methodology developed by Hillis et al. (1991). "Hillis" security areas are blocks of generally forested country with boundaries ≥ ½ mi from routes

WILDLIFE PARAMETER	ASSUMPTIONS AND INFORMATION USED	METHODOLOGIES AND SCIENTIFIC ACCURACY
	and movement patterns beyond the HNF. A Forest Plan amendment associated with this project substitutes elk security areas for the current hiding cover/road density index (the "Big Game Security Index" as a measure of elk security in the fall. Field research suggests that the security area methodology is the more accurate and sensitive of the two measures. Information on elk populations and seasonal distribution is based primarily on annual survey work by MFWP (including aerial cenuses and check-station data), but also from past MFWP radio telemetry studies.	open to motor vehicles during the hunting season. Area boundaries were then adjusted to account for a variety of local, site-specific conditions likely to increase or decrease the effectiveness of security. Smaller areas are often eliminated. Adjustments are based on aerial photos, topographic maps, road system maps, hunting data from MFWP, and wide-ranging fieldwork. Security is calculated for "hunting season range" within HNF administrative boundaries for each elk herd unit. Open routes include all roads and motor trails (public and private) available to vehicles during the big game rifle season (Oct. 15 – Dec. 1). An alternative time period is Sept. 1 – Dec. 1 (the bow and rifle season). Many of the insights as to the accuracy of interpretations derived from models, maps, and data bases come from personal fieldwork throughout the travel plan area over the past 20 years.
Threatened and Endangered Species		
Canada Lynx	The Northern Rockies Lynx Management Direction (NRLMD) (USDA 2007b) provides the background information, standards, guidelines, and general management underpinning for dealing with lynx. While this direction addresses all NF lands in the northern Rockies, It was assumed that our local survey work and habitat modeling are sufficient to allow the HNF to tweak aspects of it to provide a better fit for the Divide landscape. Potential lynx habitat and suitable snowshoe hare habitat have been modeled by HNF GIS personnel using a	Area-wide distribution of potential lynx and snowshoe hare habitat has been modeled and mapped by HNF GIS personnel, using criterea from the NRLMD. Field-based information for validating habitat modeling efforts has come from a variety of sources—including general wildlife surveys that have made note of habitat components useful to lynx throughout the landscape since the 1990s, lynx denning and foraging habitat surveys in the Tenmile drainage in 2003, and on-going Forest-wide field surveys of potential snowshoe hare habitat conducted according to Regional protocols. The

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	combination of data from the timber stand management record system (TSMRS) (field-based stand data) and V-Map satellite imagery (USDA 2009). Road and snowmobile use are derived from GIS processes that tally miles of these routes in suitable lynx habitat in LAUs [documented in the Project Record]. It was assumed, based on NRLMD guidance, that the effects of open roads and snowmobile routes in lynx habitat are imposed more by the access they provide competing carnivores and trappers than by the general presence of humans on these routes. Much of the background information for interpreting results of field surveys and modeled habitat data has come from the Lynx Science Report (USDA 1999), the Lynx Conservation Assessment and Strategy (Ruediger et al. 2000), and The Scientific Basis for Conserving Forest Carnivores (USDA 1994).	relative effects of snowmobiles are inferred from the miles of snowmobile trail in lynx habitat in different alternatives. Wild Things Unlimited (Bozeman) has run track surveys and collected DNA samples using established protocols since 2006 in the MacDonald Pass area and parts of the Little Blackfoot and Tenmile drainages (Gehman et al. 2007-2010). DNA from hair and scat samples have been analyzed by the USFS Rocky Mtn Research Station (Missoula) to identify species and individuals (Pilgrim 2007-2010). The HNF also made use of track survey transects run regularly by MFWP along the Divide for several years, as well as fortuitous observations by a number of individuals.
Grizzly Bear	Basic guidance for grizzly bear management comes from the Grizzly Bear Recovery Plan (1993) and the Interagency Grizzly Bear Committee (IGBC) Guidelines (1986), and the Grizzly Bear Management Plan for Western Montana (MFWP 2006). Application of this direction is modified by ongoing research, the slow expansion of occupied grizzly range southward across the HNF, and the development of updated management documents. The entire travel plan area lies within the Grizzly Bear "Distribution Zone"—the area south of Northern Continental Divide Ecosystem (NCDE) Grizzly Bear Recovery Zone in which grizzlies are	No specific methodologies were used other than estimates, for each alternative, of (1) open road densities and of (2) large non-motorized habitat patches (>2,500 ac) more than 0.3 mi from open roads. These patterns are shown separately for the original Distribution Zone north of Mullan Pass and the newly expanded Zone south of there. Information on distribution of grizzly bears and suitable habitat components across the Divide landscape has been derived from wildlife surveys by HNF biologists since the early 1990s, data from MFWP, and observations by field-going personnel and Forest-users. Observations of bears have been ranked as to credibilty,

WILDLIFE PARAMETER	ASSUMPTIONS AND INFORMATION USED	METHODOLOGIES AND SCIENTIFIC ACCURACY
	known to be present. The original Distribution Zone designated in 2005 was based on the pattern of grizzly sightings to that point and was limited to the area north of Mullan Pass. In 2013, however, based on information from MFWP and observations from several sources since that time, the Distribution Zone was expanded to cover the rest of the landscape down to the Beaverhead-Deerlodge NF boundary. Grizzly bear numbers throughout the landscape are assumed to be very low. Given the information on grizzly bear distribution, environmental assessments in the Divide landscape in recent years have applied management guidelines for IGBC Management Situation #5—which was assumed to be appropriate in this case as well.	and the information applied accordingly. Criteria outlined in the Grizzly Bear Recovery Plan and the IGBC Guidelines were served as the basis for analysis. The HNF does not have enough systematic observations by trained personnel to allow us to estimate population numbers for the Divide landscape or to determine if individuals are resident or transient.
Sensitive Species		
Northern Rocky Mountain Gray Wolf	U.S. Fish and Wildlife Service (USFWS) and MFWP biologists have provided information on the status of wolves in the Divide landscape regularly since the early 1990s. Much of this data has been documented in Montana Wolf Program Weekly Reports and Rocky Mtn Wolf Recovery Annual Reports (USFWS, MFWP 1995-2011). Other information has come from field observations by HNF biologists, HNF field crews, local residents, and other Forest users. More recently, we have garnered data from tracking surveys by Wild Things Unlimited (Bozeman, MT). Because of the small number of wolves in the Divide landscape at any one	The HNF used no specific methodology—only general field surveys. Wild Things Unlimited has located wolves using specific tracking and sample gathering protocols—although their efforts are focused on forest carnivores rather than wolves. Information on the whereabouts of wolves, wolf dens, and rendezvous sites has come mostly from fieldwork by the USFWS and, more recently, by MFWP. These efforts have included aerial and ground-based radio telemetry. In determining effects, we made use of local information from USFWS, MFWP, and research as identified in “References Cited”. Constant monitoring of the small local wolf population (by MFWP) results in periodic population estimates that

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	time, their relatively high profile, and the intense scrutiny given them by monitoring agencies, it is assumed that we have a more complete picture of local wolf populations than of any other wildlife group in the landscape.	are precise and accurate. Statewide wolf counts, however, tend to underestimate the total population, given its size and distribution: Recent Gray Wolf Annual Reports by MFWP (2010-2012) discuss methodologies employed to get at the actual size and configuration of the wolf population.
Wolverine	Information and assumptions used to analyze effects on wolverine are documented in Hillis and Kennedy (2003) and center around natal denning habitat. Since wolverines are most vulnerable to disturbance at these sites in late winter and early spring, it is assumed that the primary source of human disturbance would come from snowmobiles. Wolverines are often associated with large blocks of unroaded country with minimal human presence, and it was assumed that these habitat zones are important to wolverine population viability. Assessment of unroaded habitat has employed information from elk security area analysis, grizzly bear habitat analysis, and corridor/linkage zone analysis—each of which measures the size and arrangement of unroaded habitat blocks in a different way. The rationale for and parameters associated with these analyses are provided in the appropriate sections that follow. Rigorous fieldwork by Wild Things Unlimited has revealed the presence of 2 resident wolverines, but the data is insufficient to estimate population size.	Impacts to wolverine natal denning habitat typically come from snowmobile activity (Hillis and Kennedy 2003). As the current Regional habitat model has not identified any wolverine denning habitat in the Divide landscape, this parameter has been approached qualitatively. Fieldwork suggested areas that might provide viable denning sites, and the potential for snowmobile presence was then inferred from travel plan alternative maps and the Helena RD Snowmobile Trail map (2003). The most robust field data on wolverines in the landscapecomes from winter tracking surveys by Wild Things Unlimited coupled with DNA analysis by the USFS Rocky Mtn Research Station. Other field observations come from MFWP biologists, HNF field workers, local residents, recreationists, and trappers. Since the needs of wolverines with regard to unroaded habitat are murky, such habitat blocks were identified via 3 different methods (grizzly bear, elk security, and linkage zone analyses) and results compared among alternatives. The result, while imprecise, provides a basis for relative comparison.
Fisher	Analysis of the fisher is based primarily on literature	The methodology employed was to compute open road

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	review. Habitat has been modeled by the HNF GIS shop (USDA 2009) and intermittantly field-checked during general wildlife surveys. Observations of fishers in this landscape have been so rare that little is known of their local distribution, numbers, or status as residents/transients. Although we have been able to identify potential pockets of suitable habitat, we have been unable to make useful estimates of local population size. Since research indicates that fishers do not shy away from Forest roads, it was assumed that road impacts are indirect—from access provided to trappers and to firewood cutters who remove large snags of use to fishers.	miles in modeled fisher habitat (via GIS) and then calculate acres within the 600 ft wide road corridor from which firewood cutters could remove large snags and logs potentially useful to fishers. The results are useful primarily as a relative measure to compare alternatives. Systematic winter tracking surveys (Wild Things Unlimited, 2006-2011) have regularly detected lynx and wolverines in the central part of the Divide landscape, but have found no sign of fishers. Likewise, a grid of hair-snag survey stations in 2008 detected no fishers in the landscape. Reports of fishers in the Divide landscape have been fortuitous and rare, and have not been sufficient to allow an estimation of population numbers.
Black-backed Woodpecker	It was assumed that impacts of travel management on black-backed woodpeckers are indirect—related to firewood cutting and roadside hazard tree removal. Data used to analyze effects on habitat are derived from Hillis *et al*. (2002): *U.S. Forest Service Region One Black-Backed Woodpecker Assessment*. Other information and assumptions are described in *Black-backed Woodpecker Habitat Modeling Process* and in the text files and analyses run by the HNF GIS shop. Given the paucity of recent large fires in the Divide landscape, no black-backed woodpecker surveys have been conducted. It was assumed, however, that the woodpeckers are present in very low numbers—in pockets of old-growth, in small local burns (such as MacDonald Pass), and here and there	Effects of travel management on dead and dying trees in road corridors have implications for black-backed woodpeckers—low though their numbers may be. The methodology used to determine these effects is described in the section on Snags and Woody Debris. While the survey and analysis methods used to characterize the dead tree resource in well-defined, accessible road corridors have generated estimates with a high degree of precision and accuracy, the ongoing bark-beetle outbreak has produced a moving target in terms of snag density and dispersion at any given time. We can say, however, that numbers of large dead trees are increasing substantially thoughout Divide road corridors and the travel plan area as a whole. No field surveys targeting black-backed woodpeckers

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	in the extensive array of beetle-killed pine trees across the landscape. It was also assumed that in spite of the massive beetle-kill, black-backed woodpecker numbers will only escalate if parts of the landscape burn in the future—although this remains to be seen.	have been conducted in the Divide landscape, but they have been reported in the MacDonald Pass burn (from 2009).
Western Toad	Potential effects of roads on boreal toads were based on a literature review. Site specific-information for some locations—particularly riparian areas—was derived from general wildlife surveys (1992-2010) and observations by HNF fisheries biologists and by researchers from the Dept. of Natural Sciences at Carroll College.	General wildlife and fisheries surveys have made note of western toads and potential habitat for several years, but no specific methodologies to sample for amphibians have been employed. Biologists and students from Carroll College have sampled for amphibians at sites in the travel plan area over the last decade [G. Hokit, pers. comm.], and we have made use of this information.
Management Indicator Species		
Pileated Woodpecker (Old-Growth Indicator)	Pileated woodpecker habitat modeling is based on Region-1 protocols. A summary of how these protocols were applied to HNF habitats can be found in "*Criteria for Wildlife Models HNF*" (USDA 2009). See also "Snags and Woody Debris" above. Information as to distribution, relative population density, and habitat use by pileated woodpeckers in the Divide landscape comes from an array of wildlfe field surveys and fortuitous observations since 1992 [HNF wildlife files]. Based on this information, it was assumed that, although the woodpeckers are MIS for old-growth forest, they most often occur in non-old-growth habitats in this landscape, focusing on large trees as key habitat components.	The key components needed to characterize pileated woodpecker habitat in the Divide landscape are large dead and dying trees (generally >24 inches dbh). The methodology for determining effects of travel management on snags is described above in the "Snags and Woody Debris" section. Given the high mortality of mature pine trees in the current bark beetle epidemic, *all* stands of large trees in general (esp. ponderosa pine) are of interest since (1) all large pine are now at risk of mortality in the short term and (2) pileated woodpeckers are capable of foraging and excavating cavities in live trees if needed. As a result, HNF habitat models of pileated woodpecker habitat, which focus on stands with large mature and old-growth trees, now probably reflect more accurately

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		the suitability of these sites to support the woodpeckers than they have in the past. A tally of open road miles (and associated road corridor acreage) in pileated woodpecker habitat serves to indicate the relative impact of potential firewood cutting under different alternatives.
Northern Goshawk (Old-Growth Indicator)	Habitat modeled by HNF GIS specialists has been used for this analysis—the original modeling effort from 2002 having been updated (USDA 2009). Nest sites have been sought out and monitored since the early 1990s. Information regarding these sites is summarized in a number of reports in the HRD and HNF wildlife files [see Project Record]. Based on the full spectrum of goshawk observations in the Divide landscape and data on goshawk habitat and home range size in Reynolds *et al.* (1992) [as well as in other research (see references)], it was assumed that goshawks would occupy, over the course of a decade, all habitats dominated by mature green forest in the landscape—spaced out so as to allow home range size of roughly 4,000-7,000 acres (based on local field observation). An additional assumption underlying this assessment is that the existing Forest road system has relatively little direct effect on goshawks and that changes proposed under action alternatives have little impact on the ability of goshawks to effectively occupy the landscape. It was assumed that high mortality in mature pine forests from ongoing bark beetle infestation will cause substantial shifts in distribution	Goshawks have been monitored throughout the Divide landscape since 1992. In recent years, protocols developed by Region 1 and adapted by the HNF have been applied. In 2005, large grids were sampled across the HNF as part of a Regional effort to assess goshawk distribution and population trends. In addition to these standard sampling programs, most reported goshawk sightings are followed up by less formal field exercises designed to locate active nests. Nest sites are then mapped and monitored. Once clusters of nests indicating the centers of goshawk home ranges have been identified, it is possible to identify additional potential goshawk ranges throughout the landscape—and survey in those areas. Field monitoring is continuing, in particular, to document changes in goshawk home range use patterns resulting from the mountain pine beetle epidemic. A tally of open road miles in goshawk nesting and foraging habitat (and associated road corridor acreage) provides as a mechanism for comparing potential indirect effects of snag removal by firewood cutters under different alternatives. Potential disturbance of existing nest stands from opening up of currently closed roads under some alternatives provides an additional

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	of goshawk nesting sites in the near future.	means of comparison.
Hairy Woodpecker (Snag Indicator)	Hairy woodpecker habitat modeling is based on Region-1 protocols. A summary of how these protocols were applied to HNF habitats can be found "Criteria for Wildlife Models HNF" (USDA 2009). See also "Snags and Woody Debris", above. Information as to distribution, population density, and habitat use by hairy woodpeckers in the Divide landscape comes from wildlfe field surveys and fortuitous observations since 1992 [HNF wildlife files]. Northern Region Landbird Surveys have also provided data. Based on this information, it was assumed that hairy woodpeckers are very versatile as to the kinds of habitats they use and that the Region-1 model, while delineating *optimal habitat*,substantially underestimates *total suitable habitat.* So, results are presented both for (1) R-1 modeled habitat (which is based, at least in part, on Hutto 1995) and for (2) an expanded complex of mature forest habitat regardless of stand density and evidence of dead trees. This latter delineation is based on the assumption that all mature forest stands contain a few cavity prone and insect laden trees sufficient to support at least some hairy woodpeckers. Road miles in modeled habitat and mature forest habitat come from GIS spreadsheets. It was assumed that the effects of travel management are indirect—resulting from road-	Given the high mortality of mature pine trees in the current bark beetle epidemic, all mature stands with a ponderosa or lodgepole pine component now support many more snags than when HNF habitat models were last run. These developments, combined with a habitat model that presents a relatively narrow definition of hairy woodpecker habitat (referred to as "optimal" nesting habitat), result in an underestimate of habitat useful to these birds in the travel plan Area. The key components that characterize optimal nesting habitat are snag-rich mature forest stands (overstory trees >10 inches dbh) of sparse-to-intermediate density (<50% canopy closure). In the Divide landscape, this results in the delineation of considerably less habitat than hairy woodpeckers have been observed to use. So, mature forest habitat in general has also been looked at as a suitable environment for hairy woodpeckers (though not all of it may be nesting habitat). This includes all stands classified as mature forest (dbh >7 inches) regardless of density or evidence of dead trees. Acreage of hairy woodpecker habitat available to firewood cutters and susceptible to snag removal by HNF roadside hazard tree projects (the 600 ft corridor along open roads) is used to compare relative effects of different alternatives. Field surveys, while useful in indicating the habitat versatility and relative abundance of hairy woodpeckers in the Divide landscape, have not provided systematic

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	facilitated snag removal by firewood cutters.	enough data to generate actual population estimates.
American Marten (Mature Forest Indicator)	Marten habitat modeling is based on Region-1 protocols. A summary of how these protocols were applied to HNF habitats can be found "Criteria for Wildlife Models HNF" (USDA 2009). See also "Snags and Woody Debris", above. Information on distribution and habitat use by marten in the Divide landscape comes from general wildlfe field surveys, reports from trappers, and winter tracking surveys run for many years by MFWP and more recently by Wild Things Unlimited (Gehman *et al.* 2007-2011). Additional information concerning marten habitat and response to roads has come from a review of the literature [see References]. Based on these sources, it was assumed that the effects of travel management are indirect—resulting from (1) access provided trappers on snowmobiles and (2) removal of snags and logs from the road corridors by firewood cutters and HNF personnel (for safety purposes).	The key components needed to characterize marten habitat are relatively dense mature forest habitat with a suitable supply of medium to large dead trees and logs. In addition, marten are much more likely to be found in subalpine fir, lodgepole pine, Engelmann spruce, and moist Douglas-fir forests than in dry Ponderosa pine/ Douglas-fir stands. The methodology for determining effects of travel management on snags is described above in the "Snags and Woody Debris" section. As with the woodpeckers discussed above, the ongoing bark beetle infestation means that all mature stands with lodgepole pine component now support many more snags than when HNF habitat models were last run. In the short-term, these models of potential marten habitat may now more accurately reflect the suitability of these sites to support marten. Over the long long term, their suitability is likely to vary depending on the degree of remaining canopy closure and the vigor of forest regeneration. A tally of open road miles in potential marten habitat (and associated road corridor acreage) provides a mechanism for comparing potential indirect effects of snag removal by firewood cutters and routes available to trappers under different alternatives. Field surveys, while useful in indicating the presence and distribution of marten in the Divide landscape, have not provided enough systematic data to generate valid

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		population estimates.
Site-Specific Assessments		
Local Effects in Key Areas	Local areas addressed in this section were chosen based on the extent to which they were treated differently under the 3 alternatives, their importance to the wildlife resource, and, in some cases, the level of controversy they generated. It was assumed that by focusing on site-specific issues in these particular localities, the implications of implementing each alternative—and the differences between alternatives—could be clarified. Data used to define the status of these areas with regard to open road miles, local road densities, and snowmobile area closures were derived from the HNF Visitor Map, Divide travel plan alternative maps, and HNF "B-maps" (USGS 1:24,000 scale maps with the HNF road and trail system superimposed). More qualitative information on local wildlife resources and their response to different road/trail scenarios was drawn primarily from HNF wildlife field surveys (1992-2010), with supplementary information coming from MFWP surveys and mapping efforts, USFWS fieldwork, and the HNF Roads Analysis (2001-2004).	The boundaries of local areas (for purposes of calculating road densities) were defined by a combination of topographic features and the reach of the local road system at issue. In a number of cases, boundaries were drawn along section lines. Road miles were measured with an engineers' compass and areas determinied via dot grid: No GIS technology was applied, but the precision and accuracy of the more primitive methodology employed here can be assumed to be in the same range as standard GIS estimates for areas of this magnitude. Aside from these measurements, the bulk of the assessment is based on more qualitative information dealing with local wildlife associations, habitat configurations, and expected responses to the proposed scanarios presented by different alternatives.

Wildlife, Affected Environment

Introduction

The Divide travel planning area covers all but the southeastern corner (the Clancy-Unionville unit) and the northern tip (Little Prickly Pear drainage) of the Divide landscape and encompasses a wide range of wildlife habitats and wildlife species associations. Not all of these habitats and species groups are affected by Forest travel management in ways that are measurable or meaningful (in terms of individual species behavior, survivorship, or productivity). As a result, not all of the wildlife parameters (species, habitats, habitat components) tallied in the following table are analyzed and discussed in the body of the report that follows—though they may receive some mention.

Parameters not carried forward in the report are those for which there are either no anticipated impacts associated with alternatives or for which the impacts are addressed via analysis of a surrogate species [the elk analysis, for example, provides a basis for inferring primary impacts on white-tailed deer and moose]. As summarized in the previous section, the information presented in this analysis comes from survey and observation in the field, accumulated professional experience, discussion with other professionals and field-going personnel, examination of scientific literature, GIS modeling analyses, and conservation strategies and recovery plans.

Table 3.41 identifies relevant wildlife parameters, the degree to which they have been analyzed, and the rationale for the level of analysis. Analysis categories include (1) detailed effects assessment, (2) coverage under analyses for other parameters, (3) assessment of existing condition only, or (4) summary in the Wildlife Analysis Approach Table (Appendix C).

Table 3.41 Key to Documentation of Wildlife Analyses

Wildlife Parameter	Analysis Level	Comment
General Habitat	Detailed Effects Assessment	The analysis indicates that effects on general habitat, including fragmentation, habitat loss, and edge effects are minimal.
Old Growth	Examined as a sub-set of General Habitat	Effects on old growth are minimal and indirect—stemming mostly from firewood cutting along open roads .
Riparian Habitats	Detailed Effects Assessment	New effects on riparian habitats are minimal—but the existing road system creates problems in a number of areas.
Travel Corridors and Linkage Zones	Detailed Effects Assessment	Connectivity can be affected by roads and has been identified as an issue by various user groups. It is described in terms of open road density and large non-motorized habitat blocks. Differences between alternatives are measurable.

Wildlife Parameter	Analysis Level	Comment
Snags and Woody Debris	Detailed Effects Assessment	Snags and logs come into play in analyses of certain sensitive and management indicator species and as components of old-growth. Differences between alternatives are measurable. No snags would be removed to construct new roads, but road access allows their removal by firewood cutters and as hazard trees (an indirect effect).
Population Viability	Effects Assessment included in individual species sections	Since direct effects on general habitat would be negligible, the contribution to population viability remains unchanged. Any differences between alternatives would stem from indirect effects of future road use.
Big Game Species		
Elk	Detailed Effects Assessment	The Rocky Mountain elk is a management indicator species and a species of interest to several user groups. Differences in effects between alternatives would be measurable.
Mule Deer	Existing Condition Assessment Effects covered in sections on Elk	Current status of mule deer is discussed in the Specialist Report but effects are not reported. The elk analysis serves as a surrogate assessment of primary effects on mule deer. Potential differences between elk and mule deer are discussed.
Whitetail Deer	Wildlife Analysis Approach Table 3	The elk, mule deer, and riparian analyses serve as a surrogate for effects on whitetail deer.
Moose	Existing Condition Assessment	Current status and needs of moose are discussed in the Specialist Report but effects are not reported. Anticipated effects on moose are addressed via the effects assessments for riparian habitat and for elk.
Big Horn Sheep	Wildlife Analysis Approach Table	Bighorn sheep are not resident in the Divide landscape and therefore not affected by proposed alternatives.
Threatened and Endangered Species		
Grizzly Bear	Detailed Effects Assessment	Grizzly bears are present in the Plan Area in very low numbers. No new negative effects are expected from project alternatives.

[3] The Wildlife Analysis Approach Table is in Appendix C.

Wildlife Parameter	Analysis Level	Comment
Canada Lynx	Detailed Effects Assessment	Effects on lynx include compaction associated with snowmobiling and cross-country skiing and potential effects associated with road use.
Wolf	Detailed Effects Assessment	Wolves are present in and around the Plan Area, but effects of travel management on wolves are expected to be minimal.
Sensitive Species		
Wolverine	Detailed Effects Assessment	Wolverines have been petitioned for listing under the Endangered Species Act in the past and are a focal point of interest for several user groups. The focus is on potential disturbance around natal denning habitat and refuges.
Fisher	Detailed Effects Assessment	Fishers are present in very low numbers. Effects on any fishers in the Plan Area are expected to be minimal and indirect.
Townsend's Big-eared Bat	Wildlife Analysis Approach Table	Townsend's big-eared bats are not known in the Plan Area, and no effects are anticipated.
Bog Lemming	Wildlife Analysis Approach Table	There are no anticipated effects on bog lemmings.
Bighorn Sheep	see above	
Bald Eagle	Wildlife Analysis Approach Table	There are no bald eagle nests in the Plan Area: no alternative is likely to affect them.
Black-backed Woodpecker	Detailed Effects Assessment	Effects on black-backed woodpeckers would be indirect and related to firewood cutting and roadside hazard tree removal.
Peregrine Falcon	Wildlife Analysis Approach Table	There are no anticipated effects on peregrine falcons. None are known to nest in the Plan Area.
Flammulated Owl	Detailed Effects Assessment	Effects on flammulated owls would be indirect and related to removal of large snags by firewood cutters. Analyses of snags, woodpeckers, goshawks, and marten serve as surrogates for flammulated owls. Their status is addressed in the Specialist Report, but effects are not discussed.
Harlequin Duck	Wildlife Analysis Approach Table	Harlequin ducks are not present, and no effects on them or their habitat are anticipated.
Western Toad	Detailed Effects Assessment	Effects on western toads are expected to be minimal.

Wildlife Parameter	Analysis Level	Comment
Leopard Frog	Wildlife Analysis Approach Table	Leopard frogs have been extirpated from the Plan Area for 2 decades: no effects are anticipated.
Management Indicator Species		
Pileated Woodpecker	Detailed Effects Assessment	Effects on pileated woodpeckers are expected to be indirect and minimal, coming from removal of a few large snags (>30" dbh) by firewood cutters along open roads.
Northern Goshawk	Detailed Effects Assessment	Effects on northern goshawks would be relatively minor and indirect—stemming from removal of snags used by potential prey species from the open road corridors.
Hairy Woodpecker	Detailed Effects Assessment	Effects on hairy woodpeckers are expected to be indirect. While substantial numbers of suitable snags are likely to be taken from the road corridors for firewood, the percentage of hairy woodpecker habitat affected will be relatively small.
Marten	Detailed Effects Assessment	Effects on marten are expected to be relatively minor and indirect—related to snag removal along open roads in lodgepole pine, subalpine fir, and Engelmann spruce forest and to snowmobile access for trappers.
Elk	see above	See above
Mule Deer	see above	See above
Bighorn Sheep	see above	See above
Other Road Analysis Issues		
Recreation	Effects Assessment included in individual species/parameter sections	Effects of recreation associated with roads are described for each species/parameter.
Disruption/ Displacement	Effects Assessment included in individual species sections	Effects of disruption/displacement associated with roads are described for each species/parameter.
Direct Mortality	Effects Assessment included in individual species sections	Effects of direct mortality associated with roads are described for each species/parameter.

Wildlife Habitat in the Travel Plan Area

Habitats in the Divide landscape range from high alpine meadows and subalpine fir/whitebark pine forests to low- and mid-elevation Douglas-fir and ponderosa pine forests interspersed with with dry grassland and shrubland. Cool moist forests comprise a majority of habitats, followed by warm dry forests, grasslands/shrublands, riparian habitats, and aspen (Divide Landscape Analysis 1996b).

This analysis looks at 3 major habitat categories that may be affected measurably by travel management: (1) general wildlife habitat (including old-growth forest), (2) riparian habitat, and (3) snags and woody debris. We refer to analysis at this broad scale as "coarse filter" analysis. A coarse filter assessment focuses on maintaining a diversity of habitats and habitat functions for a full range of species (USDA 1996c). Landscape-wide habitat functions included in the coarse filter analysis are wildlife travel corridors, linkage zones, and habitat fragmentation.

Species-specific analyses are characterized as "fine filter" analyses, and they focus on maintaining habitat for particular species—in particular, threatened, endangered, sensitive, and *Helena Forest Plan* indicator species. The *Key to Documentation of Wildlife Analysis* above lists those species addressed in a fine filter format.

General Upland Wildlife Habitats

Forest Habitats

Forest habitat in the travel plan area can be divided into a variety of categories: (1) warm, dry Douglas-fir/ponderosa pine at lower elevation; (2) mixed lodgepole pine and Douglas-fir forest, mostly at mid elevation; (3) lodgepole pine forest at mid to high elevation; (4) moist subalpine fir-dominated forest at high elevation; (5) Engelmann spruce-dominated forests, mostly in drainage bottoms and across cool benches and basins; (6) forests with a notable whitebark pine component at high elevation; and (7) aspen forest, both riparian and upland, over a wide elevational range, usually in small fragmented stands. Mature closed-canopy stands in the 80-120 year age range curently dominate the landscape. But, over the past 6-7 years a mountain pine beetle (MPB) infestation has been killing mature lodgepole and ponderosa pine trees (and lesser amounts of whitebark pine and limber pine)—a process that is transforming forest structure across the landscape.

Habitat for post-fire dependent wildlife remains limited in the Divide landscape. Until 2009, only two stand-replacing fires in excess of 100 acres had occurred in recent decades: (1) the Beartrap Gulch fire (1960s) in the upper Little Prickly Pear drainage and (2) the lower Sweeny Creek fire (1950s) on the northeast side of that drainage. The Beartrap burn is located in unroaded country below the Continental Divide and supports a rich array of early seral conifers (mostly lodgepole pine), shrubs, and ground vegetation, and, as a result, is an attractant for numerous wildlife species. In Sweeny Creek, the ponderosa pine seed source was eliminated, and the area now supports a mosaic of grass-shrub and aspen communities with little conifer regeneration. Few snags remain in these burns. More recently, the MacDonald Pass fire burned a 170-acre swath through the Walker Creek drainage in the early fall of 2009, and is the only burn with an abundance of recent fire-killed snags in the travel plan Area.

Other than these 3 areas, early-seral conifer habitats have been created mostly by timber havest, which has not produced the dead tree habitat that attracts many post-fire wildlife species. Concentrations of winter-killed trees in the upper Snowshoe and Dog Creek drainages in the late 1980s and around Jericho Mountain in the early 1990s produced some local habitat opportunities for these species. But now, the bark beetle outbreak is in the process of creating landscape-wide dead tree habitats in a variety of configurations, ranging from snags dispersed through predominantly green canopy to extensive swaths of dead trees across whole drainages.

For purposes of this discussion, the variety of forest types listed above have been condensed into two primary categories: cool moist forests and warm dry forests.

Cool Moist Forests

Cool, moist forests at middle and higher elevation represent the predominant habitat formation across the Divide landscape. These forests are most often dominated by lodgepole pine. Engelmann spruce occurs primarily in riparian sites, across cool basins and benches, and on certain north and east slopes. Subalpine fir is also present in these situations as well across much of the landscape at high elevation. Whitebark pine is confined to high elevation sites, often growing on dry, rocky substrates (making these stands a marginal fit as "moist" forests). It is most common at the northern and southern ends of the landscape, along the Continental Divide around Black Mountain in the north and Thunderbolt Mountain in the south.

At middle elevations, Douglas-fir is a dominant presence on many "moist" sites, often in combination with lodgepole pine. Douglas-fir stands are coming to represent the primary mature forest component over much of the Divide landscape as lodgepole pine succumbs to mountain pine beetle.

In some lodgepole pine stands, canopy trees are old and decadent and are being succeeded by climax subalpine fir at higher elevation and by Douglas-fir at mid-lower elevation. But over much of the travel plan area, especially in the upper Little Blackfoot drainage south of Highway 12 and along the Continental Divide in the northern reaches of the planning landscape, lodgepole pine maintains relatively pure stands of 80-120 year-old trees—a product of fires and widespread logging in the late 19th and early 20th centuries. The ongoing mountain pine beetle infestation is opening up the canopy in many of these stands as mature trees die. This will eventually increase the vegetative and structural diversity of the understory, which for the most part has been lacking in complexity. On the other hand, it will increase fuel loading as trees come down and the probability of these stands being completely transformed by wildfire.

Warm Dry Forests

On the warmer, drier sites—mostly at middle and lower elevations—forests are dominated by a mixture of Douglas-fir and ponderosa pine. Absence of regular fire in these stands—abetted by historic logging—has transformed many of these once mostly open-grown mature stands into dense, multi-storied forests no longer able to survive a fire of any intensity. In terms of habitat for native herbivores, this represents a shift from a forest environment with minimal horozontal cover and productive ground vegetation (forage) to one with decent hiding/screening cover but scant understory forage. Under current conditions, the contribution of early seral forest habitat to this part of the landscape is more meager than under historic conditions—most young forests having been generated by timber harvest on both public and private land rather than by fire. Seral species in these forests are Douglas-fir at middle and higher elevations and, a mixture of Douglas-fir and ponderosa pine at lower elevations, with some limber pine and juniper.

Old-Growth Forest

Old-growth forests are unique for their diversity and for the variety of niches that they offer. While no local wildlife species are absolutely dependent on old-growth for their survival, a number of them find optimal conditions in these old forest environments.

The Divide landscape supports two general types of structural old growth: (1) cool-moist types (classic Pacific Northwest old-growth) and (2) warm-dry savannah types.

Cool, moist structural old growth stands occur primarily at upper elevations, on north slopes, and in drainage bottoms. Most often, this type of old growth occurs in blocks or patches of limited size. These patches, however, are usually surrounded by younger closed-canopied conifer stands, which creates a wider interior forest condition. Cool, moist old growth habitats have multi-layered canopies, abundant

woody debris, and varying age classes of snags. They support varied understory vegetation and maintain light and climatic variables that offer a diversity of wildlife niches (Franklin *et al.* 1981). Large snags, along with dead and down material, supply food and nesting for cavity dependent birds as well as a variety of insects. The dark, mesic environment is a microsite that provides for a variety of fungi and insects, which in turn become food for small mammals and birds, adding to the species richness and diversity. Resident species include pileated woodpeckers, brown creepers, hermit thrushes, northern goshawks, western tanagers, hairy woodpeckers, white-breasted nuthatches, Stellars jays, spruce grouse, red-backed voles, marten, and northern flying squirrels, among others. Native ungulates use these areas in summer for thermal cover to reduce heat stress. In winter these areas are important foraging and denning habitat for marten and also provide opportunities for wolverine, fisher, and lynx.

Historically, warm, dry old-growth was characterized by large open-grown Douglas-fir or ponderosa pine stands with abundant grasses, forbs, and small shrubs in the understory (Braun *et al.* 1966). Large snags were scattered throughout, but logs, as well as young conifers, were kept to a minimum by frequent ground fires (Knight 1989, Barret and Arno 1999). Species favored by these habitats include flammulated owls, pygmy nuthatches, violet-green swallows, mourning doves, western bluebirds, pine siskins, flickers, Cassins finches, Clarks nutcrackers, red squirrels, ground squirrels, chipmunks, and pocket gophers, among others. Foraging opportunities for deer and elk were excellent. A majority of these old-growth formations were logged during the late 19th and early 20th centuries, and most of those that have survived are now changed due to fire suppression—full of dense multi-layered understory, no longer capable of suriviving periodic fire, and inhabited by a different array of wildlife.

Grassland and Shrubland

Natural grassland and shrubland habitats occur throughout the Divide landscape as diminutive openings amidst mature forest, as small upland parks, as dry-mesic regions around central riparian sites, as foothills extensions of non-forested valley habitats, and as expansive montane grassland covering hundreds, and sometimes thousands, of acres. Altogether, they occupy about 10% of the landscape. Most are dominated by grasses and herbaceous forbs. Shrubs cover a much smaller proportion of unforested habitats—often in rough, rocky terrain or other sites with harsh substrate. Among the larger upland shrubs, big sagebrush is the most widespread and the most likely to be found in stands of any prominence. Others, such as bitterbrush, chokecherry, mountain mahogany, common juniper, and rabbitbrush may be locally common.

The Divide Landscape Analysis (USDA 1996b) estimates that grassland and shrubland habitat has been reduced by roughly 15-30% since the early 20th century. This is a function of fire suppression that has allowed conifer forests to methodically colonize open habitat, eliminating smaller openings, diminishing the size of larger parks, and fragmenting many of them into an array of smaller grassland patches. Ecotone edge is often deep and varied. This has reduced habitat for grassland wildlife species and intensified competition between native herbivores and domestic livestock that graze the National Forest allotments from late spring through early fall.

Riparian Habitats

Characteristics of Riparian Zones

Riparian areas occupy a relatively small share of the Divide landscape (less than 3%). Though highly localized, these productive habitats are widely distributed in association with perennial, ephemeral, and intermittent streams, ponds, springs, seeps, and perched water tables.

Riparian zones are diverse, dynamic, and complex habitats. They control energy and material flux, provide habitat for a variety of species, and are sites of biological and physical interaction at the terrestrial/aquatic interface (Kauffman *et al.* 2000). Riparian zones exhibit a high degree of biodiversity—a function of their

position at the lowest points on the local landscape, where they are shaped by gravitational forces that bring in water, sediment, and organic matter. The microclimate of riparian zones is different from that of surrounding habitat, characterized by increased humidity, more shade, and increased air movement (Thomas 1979). Fire return is often longer in riparian zones. Riparian zones, though a relatively small percentage of the landscape (0.5 percent of the land area in the Northern Region) provide habitat for a disproportionate number of wildlife species (Thomas 1979):

- They maintain high vegetative and structural diversity that creates habitat opportunity for more species;
- They host unique vegetation assemblages and may be the only herbaceous communities in forested ecosystems or the only tree-dominated community in grasslands;
- They serve as natural corridors and migration routes.

Riparian-Associated Wildlife

Riparian areas provide more breeding habitat for birds than any other kind of habitat association in North America (Kauffman *et al.* 2000). In the Rocky Mountain region, they contain more vulnerable bird species than any other kind of habitat association. Numerous landbird species (ruffed grouse, willow flycatcher, yellow warbler, song sparrow) are tied to the shrubs or deciduous trees associated with riparian environments (Hutto and Young 1999). Studies of bird associated with willow riparian willow habitat conducted by the Northern Region landbird monitoring program in 2001 found 13 bird species that were "riparian-dependent" and 10 others that were "riparian-associated" (Young *et al.* 2003). Riparian-dependent species were Wilson's warbler, spotted sandpiper, fox sparrow, American redstart, willow flycatcher, common yellowthroat, veery, cedar waxwing, nothern waterthrush, common snipe, song sparrow, yellow warbler, and Lincoln's sparrow. Riparian-associated species were MacGillivray's warbler, spotted tohee, gray catbird, red-winged blackbird, white-crowned sparrow, dusky flycatcher, lazuli bunting, warbling vireo, red-naped sapsucker, and black-headed grosbeak. The study included four sites in the Divide travel planning area, and results for these areas reflected those of the region as a whole.

Amphibians require riparian areas for part, if not all, of their life cycle. Because of their limited mobility, their survival on the landscape is favored by continuous riparian zones that allow effective dispersal and migration to other unoccupied habitat. Primary amphibians in the Divide landscape are spotted frogs, western toads, and long-toed salamanders. Leopard frogs, once common, are now probably esxtinct in this landscape.

Mammals are also drawn to riparian zones because of their high structural diversity, proximity to water, and favorable microclimates, which combine to provide a varied and abundant forage supply. Some species, such as mink, beaver, muskrats, and water voles, are tightly tied to aquatic and riparian environments. Most wide-ranging mammals, such as deer, elk, moose, foxes, bears, and mountain lions, though they spend the bulk of their time in upland habitats, are sooner or later drawn to riparian areas—for water, abundant forage or prey, cover, or thermal relief. Riparian zones are thus focal habitats that concentrate mammalian activity.

Human Influences

Riparian areas tend to attract a disproportionate amount of human activity— recreation, home building, livestock grazing, and roads. Partly as an aid to quantifying human impact on riparian zones, streamside riparian habitats have been designated as *Riparian Habitat Conservation Areas (RHCAs)*—corridors that vary from 150 to 300 feet on either side of the stream channel.

Currently, 83 miles of open road and motor trails pass through RHCAs in the Divide travel planning area, in addition to numerous routes (motorized and non-motorized) crossing wet soil types not directly associated with streams. HNF Fisheries biologists and hydrologists have classified roads and motor trails

within RHCAs as "high risk roads". This includes the 83 miles open to motorized use and another 10 miles of closed roadway that continue to deposit sediment in the streams. They consider the zone of influence of these routes to extend out 300 ft on either side along fish-bearing streams and 200 ft along non-fish-bearing streams [See the Fisheries and Watershed Specialist Reports].

Since the 19th century, human enterprises, including roads, have substantially reduced the effective size of riparian habitats. Elimination of much of the beaver population—initially a consequence of the 19th century fur trade and since then, a means of providing dry ground for livestock grazing, agriculture, settlement, and roadways—has been a major contributing factor. Channelization of streams, diversion of water for irrigation, and draining of wetlands are other means by which riparian habitats have been modified to serve these ends.

Connectivity and Fragmentation

Connectivity Basics

Connectivity, as coined in 1984 by G. Merriam (cited in USDA 1997), refers both to the abundance and spatial patterning of habitat and to the ability of animals to move from patch to patch of similar habitat. *Corridors* are a means by which connectivity is provided and are defined as strips or stepping stones of "hospitable territory traversing inhospitable territory providing access from one area to another" (Dendy 1987 as cited in USDA 1997). Broad corridors with potential to provide for species welfare over longer periods of time are sometimes referred to as *linkage zones* [see the following section].

Some corridors—particularly local connections between forest or riparian patches—can be readily recognized by their vegetation structure and composition, which contrasts with the dominant surrounding environment (Harris 1984, pp. 141-144). Most corridors, however, are not obvious, well-defined features of the landscape that can be precisely defined by topography or vegetation. Rather, they can only be defined by following the movements of animals that make use of them over time, and their effectiveness varies for different species (Servheen 2006). The combination of habitat parameters that makes a corridor suitable for an elk will be different for a lynx and different still for a mink. Most animals need a certain degree of habitat connectivity, at one scale or another, to forage within a home range, for dispersal to new home ranges, and for migration between locations.

Fragmentation is the converse of connectivity. Fragmentation occurs when a particular habitat—be it riparian, forest, or grassland—becomes partitioned into smaller patches either by natural means (such as conifer colonization in grasslands or fire in forests) or by human enterprises (such as logging, settlement, or road building). Corridors are particularly susceptible to fragmentation because of their relatively narrow, linear configurations.

The *Northern Region Connectivity Protocol* (USDA 1997) provides a framework for describing corridors and the effects of Forest projects and other human activities. Of the five types of corridors outlined in the Protocol, four apply to the Divide travel planning area: season migration corridors, dispersal/emigration corridors, travel corridors, and invasive corridors.

Season migration or *cyclic corridors* may be transcontinental in scope or they may lie entirely within local home ranges. Transcontinental/continental migrations are relevant to the Divide landscape in that well-defined seasonal flyways used by waterfowl and raptors pass over the area. Locally, the most obvious examples of seasonal migrations are spring and fall movements by native ungulates between winter and summer ranges, inevitably along relatively well-defined routes. Historically, these routes were dictated by topography, snow conditions, and the availability of resources (particularly, forage, water, and cover). Over the past 150 years, these routes have shifted in response to human development: In part, they

follow the old resource/topography-driven routes but divert as necessary to avoid roads and other centers of human activity and to take advantage of cover.

Travel corridors are local routes established by individual animals or groups of animals to move within home ranges between foraging habitat, cover, breeding sites, and so on. As with local seasonal migration, these routes may shift in response to human enterprises, and for any particular species, they may be difficult to define in terms of features on the landscape—their delineation requiring long-term field observation.

Dispersal and *emigration corridors* promote movement into unoccupied habitats. Dispersal behavior is most common when population density is too high within an area to support the population, resulting in natural colonization of suitable but unoccupied habitat elsewhere. This has been occuring locally with the gradual influx of wolves and grizzly bears into and through the Divide landscape from growing populations to the north.

As with seasonal migration corridors, *invasive corridors* may be continental (Eastern blue jays moving across the Great Plains via wooded river corridors) or local (cowbirds following cattle trailing up onto the National Forest). These corridors may serve to sabotage biodiversity in local ecosystems with inadequate resistence to invaders—particularly in the case of exotic weeds such as knapweed, leafy spurge, and Dalmatian toadflax.

Regional Connectivity Through the Divide Landscape

The Divide travel planning area is part of what has been characterized as the Continental Divide linkage zone. A *linkage zone* is a region of suitable habitat in which dispersing animals (grizzly bears, wolves, wolverines, moose, elk, and so on) can live as they slowly make their way between larger blocks of more suitable habitat [see USDA 1997 (Region 1 *Connectivity Protocol*); also, Servheen *et al.* 2003]. The area along the Divide has also been called a "dispersal corridor" or a "travel corridor". However, as Servheen and others (2003) point out, the term "corridor" implies a fairly well defined, linear strip of habitat used just for travel. In the case of the Divide landscape, the movement zone encompasses the entire breadth of National Forest lands centered on the Continental Divide (and, for some animals, includes blocks of adjacent non-Forest land). While the linkage zone is up to 25 miles wide across the Helena Ranger District, most dispersing species tend to concentrate in areas of productive habitat such as the array of drainage-head basins near the Divide or some of the primary drainage bottoms.

Prior to development by settlers from the East, areas surrounding the Divide landscape provided more of a linkage zone for many animals than the mountains themselves. As indicated in the Journals of Lewis and Clark and documented archeologically (Knight 1989), numerous bison, elk, deer, and pronghorns, accompanied by the large carnivores that preyed upon them, regularly moved through the valleys of the Missouri and Clark Fork Rivers and their tributaries. Today, options for movement in the valleys have been substantially reduced, and often eliminated, by human development. This has placed an emphasis on National Forest lands along the Divide mountain ranges to provide connectivity. Although some animals need specific habitat formations while dispersing (fishers require mature forest, for example), most species of concern are attracted to the HNF region of the Continental Divide simply because it contains less human development than the foothills and valley environments on either side.

The Divide has some limitations in its ability to provide connectivity. The landscape, while dominated by mature forest, is fragmented by large openings, natural and human-created (favorable for some species, unfavorable for others). In addition, riparian areas that historically served as primary movement corridors have been disrupted since the 19th century by mining, settlement, water diversion, logging, grazing, and roading. Roads continue to be be a potentially disruptive (if not a truly "fragmenting") influence: Aside from Highway 12, which may serve as a real barrier to some species because of its width

and traffic volume, roads in the Plan Area are troublesome primarily because of the way they funnel human activity into the heart of the Divide linkage zone. But, they seldom block movement.

Be that as it may, Walker and Craighead (1997) concluded that the Big Belt Mountain Range to the northeast, in spite of a number of geographic and human-generated problems, was the more viable dispersal route for large wildland animals (elk, mountin lions, grizzly bears) moving southward through this part of Montana, primarily because of high road density in the Divide landscape (both on the HNF and adjacent non-Forest lands). Total road density in the Divide landscape averages 2.07 mi/mi^2; *open* road density is 1.69 mi/mi^2; *weighted open* road density (calculating arterial and collector routes at 100% of length; local roads at 25% of length) is 0.90 mi/mi^2. Compare this with weighted open road densities in the Big Belt Range which are generally on the order of 0.2—0.5 mi/mi^2.

Characteristics favorable for corridor/linkage zone function for most species (esp. the large carnivores and ungulates) include low open road density, low concentrations of human occupancy (as represented by occupied buildings, developed recreation facilities, mining operations), an abundance of productive foraging habitat, a robust mix of forested and non-forested habitats (abundant edge), and gentle-moderate terrain (Craighead *et al.* 2001; Walker and Craighead 1997; Servheen *et al.* 2003; Olimb and Williamson 2006). These features are distributed unevenly across this part of the National Forest.

So far, our understanding of how the Divide landscape functions as a linkage zone (connecting the Northern Continental Divide and Greater Yellowstone ecosystems) is based mostly on circumstantial and anecdotal evidence: the area is strategically located between these two large wildland ecosystems, it contains suitable habitat, and a number of species characteristic of the two wildland areas (wolves, grizzly bears, lynx) have been observed in the Divide landscape in between. More research is needed to reveal more precisely how this area may be functioning as a linkage zone.

Table 3.42 tallies acreages for non-motorized habitat patches larger than 1,500 acres in the Divide travel planning area. Most patches encompass some Forest roads, but all are closed to wheeled vehicles yearlong. Where patches occur within the three inventoried Roadless Areas, acreages do not always match up, since the "Roadless Areas" may include a few open roads, which were excluded from the non-motorized patches. Also, some of the patches that were delineated encompass non-motorized acreage adjacent to the Roadless Areas. The non-motorized patches were mapped from roads' edge on Divide travel plan alternative maps and then rounded acreages to the nearest 25 acres. Only National Forest lands were included in this summary.

Table 3.42 Non-motorized habitat patches larger than 1,500 acres in the Divide Travel Plan Area

Area Identification / Location	**Acres with No Motorized Use Spring-Summer-Fall**	**Acres with no Motorized Use in Winter**
Area North of U.S. Highway 12		
Black Mountain East	3,325	1,975
Black Mountain West	4,675	4,300
Upper Deadman Creek	4,650	4,650
Right Hand Jerusha Gulch	1,925	1,675
Esmeralda Hill—Clark's Canyon	1,575	1,575
Upper Snowshoe Creek	2,950	1,400
Greenhorn Mountain	2,250	2,100

Area Identification / Location	Acres with No Motorized Use Spring-Summer-Fall	Acres with no Motorized Use in Winter
Sweeney—Austin Creek	3,850	3,850
Priest Pass—Austin Creek	1,600	1,600
Little Porcupine Creek	3,375	2,550
Area South of U.S. Highway 12		
Lazyman—Black Mountain	11,650	11,650
Jericho Mountain	2,825	2,825
Walker Creek—Mike Renig Gulch	9,475	5,000
Minnehaha—Tenmile Creek		3,400
Lee Mountain	2,625	2,625
Red Mountain	2,950	2,950
Upper Elliston Creek—Slate Lake	4,100	2,375
Hat Creek	4,850	4,675
Upper Spotted Dog Creek	2,375	2,250
Spotted Dog—Trout Creek	1,775	1,775
Negro Mountain North	2,250	950
Ontario Creek—Treasure Mountain	4,150	1,275
Bison Creek	5,575	5,325
Electric Peak	18,950	18,950
Total Patch Acres North of Hwy 12	**30,175**	**25,675**
Total Patch Acres South of Hwy 12	**73,550**	**66,025**
Total Acres in Non-Motorized Patches	**103,725**	**91,700**

In this assessment, the minimum non-motorized patch size of 1,500 acres (nearly 2½ mi^2) puts the focus on the availability of habitat blocks large enough to allow wildland species slowly moving through a linkage zone to carry on with normal activities relatively free from human interference epitomized by motorized transport and recreation. Table 3.43 summarizes the general status of these large habitat patches in summer and winter.

Table 3.43 Summary status of large habitat patches (> 1,500 acres) free from motorized use in the Divide Travel Plan Area.

Non-Motorized Habitat Patches larger than 1,500 acres	**Large Patches Free from Wheeled Vehicles**	**Large Patches Free from Snowmobiles**
Number of Patches: North of Hwy 12	10	10
" South of Hwy 12	12	12
" Total Plan Area	22	22
Average Patch Size: North of Hwy 12	3,018 ac	2,568 ac
" South of Hwy 12	6,129 ac	5,502 ac
" Total Plan Area	4,715 ac	4,168 ac
Percent of Planning Area in Large Non-Motorized Patches: North of Hwy 12	53 %	45 %
" South of Hwy 12	74 %	67 %
" Total Plan Area	67 %	59 %

On average, non-motorized habitat blocks are larger in the southern half of the planning area. This is a function primarily of the three inventoried roadless areas south of Highway 12 (Lazyman Gulch, Jericho Mountain, and Electric Peak), which support regions of non-motorized habitat ranging from 9,475 to 18,950 acres. Non-motorized patches are somewhat smaller in winter. This follows from the presence of some roads within the patches that, while closed yearlong to wheeled vehicles, are open to snowmobile use in winter.

The fact that a relatively large proportion of the Plan Area (67% in spring, summer, and fall; 59% in winter) is occupied by blocks of habitat ranging from 1,575 to 18,950 acres in which motorized disturbance—and resulting human presence—is usually not a disruptive factor, suggests that the Divide landscape may be more robust as a linkage zone than straight road density figures might indicate (current *unweighted* road density for public and private lands is 2.1 mi/mi^2—quite high). Although previous modeling efforts have pointed to the Divide landscape as a problem area (potentially a "bottleneck") in north-south movement for large wildland species (Walker and Craighead 1997), the fact remains that these species (wolves, wolverines, grizzly bears, black bears, lynx, bobcats, mountain lions, elk, moose) continue to move through and occupy this part of the landscape (albeit, sometimes in low numbers).

The problem with most roads in the Divide landscape is not so much that they physically "fragment" wildlife habitat in a way that prevents species from moving between habitat patches, but rather that they facilitate human access throughout the landscape. Most roads are local dirt and gravel routes that carry little vehicle traffic most of the year. Exceptions are U.S. Highway 12 through MacDonald Pass, the Rimini road (Powell County Road #495) along Tenmile Creek, the Little Blackfoot River road (Forest Road #227), the Mullan Pass–Austin Creek road (Forest Road #1805), the Sweeny Creek–Priest Pass road (Forest Road #335), the Orofino Gulch road (Lewis & Clark County Road #454), and the Grizzly Gulch road (County Road #753).

Of these, Highway 12 is currently the only wide, paved thoroughfare: With 4 lanes and often high volume of fast-moving traffic, it has proven to be a barrier to many animals in terms of their ability to get across alive. Bobcats, lynx, wolves, badgers, foxes, coyotes, deer, elk, owls, hawks, grouse, rabbits, squirrels, and

others have been struck and killed on the relatively narrow HNF portion of the highway in the last decade. Five of the 6 primary Forest roads are graded gravel roadways that allow relatively high speeds (30-50 mph in some cases) and support regular traffic flow (though much less than Highway 12). As such, they displace animals from the vicinity and interfere with movement, though they seldom block it entirely. The Orofino Gulch road immediately south of Helena and just east of the travel plan area is paved and, while much narrower than Highway 12, does allow higher speed and greater traffic volume than other Forest roads.

Table 3.44 shows current open road density in the planning area measured in four ways. The *unweighted* open road density across all ownerships, public and private, is high and suggests that the Divide landscape is an inhospitable environment for wildland species attempting to move through the linkage zone. Density is substantially higher if closed roads are included (as has been done in some past modeling efforts). Road densities on this order are a good part of the reason that Walker and Craighead (1997) concluded that the Divide landscape on the HNF was a risky connecting route between wildland ecosystems to the north and south. On the other hand, *weighted* open road densities[4], which factor in the level of vehicle use that various parts of the road system typically receive, suggest a more benign scenario.

Table 3.44 Four measures of current road and motor trail density in the Travel Plan Area

Routes	**Weighting**	**Ownership**	**Density (mi/mi²)**
All Roads and Trails (open and closed)	unweighted	HNF, County, Private	2.1 mi/mi²
Open Roads and Motor Trails	unweighted	HNF, County, Private	1.7 mi/mi²
Open Roads and Motor Trails	unweighted	HNF, County	1.3 mi/mi²
Open Roads and Motor Trails	weighted	HNF, County, Private	0.9 mi/mi²

Overall, existing road density and dispersion in the travel planning area do not preclude any wildland species from occupying the landscape at current levels of motorized use. The presence of grizzly bears, lynx, wolverines, and robust elk populations attest to this conclusion. The road pattern, however, is well above what these species would encounter in a wildland environment: It raises the level of risk from human encounters and it substantially reduces habitat options compared with those that were available prior to development of the transportation system. Problems with roads in the Divide landscape are due as much to the location of certain roads in sensitive wildlife habitat sites as it is to overall weighted road density (see the discussion in *Riparian Habitats* above and in *Local Effects in Key Areas* toward the end of this report).

[4] In this analysis, roads are weighted by a different set of factors than the one used in the *HFP* elk analysis that follows later in this report. In this case, primary and collector roads are calculated at 100% of length; local roads that receive little traffic are calculated at 25% of length; and closed roads and private roads not open to the public are not included.

Snags and Woody Debris

Dead Tree Environments

Tree decay is an ecological function that creates key habitat elements—snags and logs—for wildlife (Rose *et al*. 2001). Living trees with decay, hollow trees, and dead trees are expressions of mortality agents (e.g. fire, disease, and insects) that create a range of snag species and sizes (Bull *et al.* 1997) utilized in different ways by different wildlife species. While snags and logs have long been seen as essential wildlife habitat components, research increasingly underscores the need to understand them as part of a larger interacting ecosystem (Bull *et al.* 1997, Duncan 1999, Duncan 2002, Rose *et al.* 2001).

Snags provide the primary substrate for the cavities that many birds and arboreal mammals require for an array of basic life functions (Thomas 1979). Woodpeckers are the most prominent excavators of cavities in the Divide landscape. Some species, such as pileated and black-backed woodpeckers are able to excavate trees with hard exterior sapwood shells and decaying heartwood. Weaker excavators, such as hairy and downy woodpeckers—as well as diminutive non-woodpecker species such as chickadees and red-breasted nuthatches—select trees with softer exterior wood created by armillaria root rot and other saprophytic fungi (Rose *et al*. 2001).

Most woodpeckers excavate a new cavity each year (Bull *et al.* 1997), thereby generating a continuous resource for secondary cavity users—species unable to produce their own cavities. These include several species of owls, myotis bats, kestrels, wrens, tree swallows, bluebirds, marten, red squirrels, and flying squirrels, among others. The variability among secondary cavity users in their use of snags is broad. Saw whet owls, for example, use cavities with a minimum tree diameter (at breast height) (dbh) of 12 inches (Thomas 1979; Bull *et al.* 1997). Larger owls such as great gray, great horned, and barred owls use platforms created when snags break (Bull and Duncan 1993; Bull *et al.* 1997). Brown creepers nest between partially detached pieces of bark and the trunks of dead trees (McClelland 1977. Bats roost under the loose bark of snags but also in cavities (Bull *et al.* 1997). Marten use hollow trees for denning and shelter. Black bears will den in and under larger hollow trees (averaging 43 inches dbh) (Thomas 1979; Bull *et al.* 1997).

In addition to their role as nesting and foraging habitat, snags also support other activities, including singing, viewing, perching, estivating, communicating, escaping, hibernating, resting, and observing (Davis 1983).

Snags continue to be important to wildlife once they fall and become logs. Logs provide foraging sites, hiding and thermal cover, denning sites, nesting sites, and travel conduits for small animals, such as chipmunks, pack rats, deer mice, weasels, marten, grouse, toads, and salamanders (Rose *et al*. 2001). Larger animals, such as bears, forage for invertebrates in logs. Fishers use large logs as den sites; lynx typically select dense patches of downed trees for denning. As logs continue to decay and lose structure, they play an important role in nutrient cycling, soil fertility, and erosion control, among other functions (Maser *et al.* 1988).

Snag and log occurrence is variable and hard to predict under natural disturbance regimes. Most dead tree concentrations are produced by fire, and while it is possible to estimate the relative probability of fire occurrence and expected fire behavior in a particular vegetation/fuel environment, actual predictions as to when and how such events might play out not have proven useful for planning and management purposes. In dry ponderosa pine/ Douglas-fir forests, frequent non-lethal fires result in low snag variation over time (Ritter *et al.* 2000). Mixed coniferous forests (most commonly Douglas-fir/ lodgepole pine in the Divide landscape) often experience a mixed severity fire regime, which results in considerable variability in snag density. Cool lodgepole pine and spruce/fir forests generally experience infrequent stand-replacing fires, which generate periodic snag pulses (Lyon 1977).

Snag Status in the Divide Landscape

Currently on much of the HNF, pine forests at all elevations and over all moisture regimes are under attack from Moutanin pine beetles, resulting in landscape-wide snag densities on a scale usually produced only by large fires. The Divide landscape has been devoid of large-scale fire since the early 20th century, and the rapidly spreading snag-rich environment represents a transformative phenomenon for wildlife habitat and associated wildlife species in this area.

Snag abundance at current levels will be short-lived. Most ponderosa and lodgepole pine trees will have fallen within 3-8 years of their demise. The resulting accumulation of large woody debris will provide an environment for a different assemblage of wildlife species. Because ponderosa pine decays relatively quickly, these sites will be characterized by low-lying debris—punky broken logs, soft stumps, and a few standing trunks broken off partway up. Lodgepole pine snags are generally more solid, and they often stack up as they come down. Mixed with regenerating saplings, these debris mazes provide good hiding and resting enclaves for elk, deer, bears, lynx, hares, grouse and numerous other animals.

Travel management on the Forest affects dead tree habitat in that most large snags within sight of Forest roads are taken by firewood cutters. Each year, the HNF issues hundreds of firewood permits that allow removal of several cords of wood in the form of dead or dying trees. Almost all firewood cutting occurs within 300 ft of open roadways—which makes any decision to close or open a road a key to the fate of local snags. Retaining snags as wildlife trees is rarely a primary objective for closing a road, but it may figure in as a secondary issue in some cases.

Even with the rapidly developing abundance of snags in road corridors, it is likely that most of them will be taken for firewood in the next few years. Others will be taken by Forest Service crews to keep roads and trails open and provide for public safety. Standing snags and woody debris in the road corridors will disappear much more quickly than will be the case in other areas where only natural forces are at work.

Big Game Species

A variety of big game species inhabit the planning area: elk, mule deer, white-tailed deer, moose, mountain lions, black bears and, in very low numbers, grizzly bears. This analysis focuses on elk and their role as management indicators that can be used to monitor the effects of land management on other species. We assume that the effects of human actions on elk more or less pertain to other big game species as well, although there will be species-specific differences that are not reflected in the elk analyses that follow. Some of these differences are described in sections on individual species below (*Mule Deer, Moose*), and the rest in the Wildlife Analysis Approach Table in Appendix C.

Elk

Management and Analysis Strategies

The American elk (*Cervus elaphus*) serves as a management indicator for hunted species on the HNF (as it does on most National Forests in Region 1). Montana Fish, Wildlife and Parks, the Forest Service, and other agencies manage elk to provide a surplus for hunters while holding populations well above levels required for viability. Population viability of elk in the northern Rockies has not been at risk since the early 20th century. Elk are one of the more manageable wildlife species: their habitat requirements are well studied and they respond readily to habitat change and population manipulation (Cooperrider 2002). Elk are adaptable and occur in a variety of habitats including high mountain forests and meadows, grasslands, shrublands, cold deserts, and highly managed forests (Skovlin *et al.* 2002). Prior to European settlement, elk in Montana were commonly observed in the grasslands and river bottoms of the Great Plains year-round. However, due to habitat alteration in the valleys and on the prairies (most often from livestock and crop raising) and the extirpation of elk from areas of human settlement, most elk now find

summer range in mountain grasslands, meadows, and coniferous forests, descending to ranges in the foothills and adjacent valleys only in winter (Skovlin *et al.* 2002).

Managing for elk has become increasingly complex as human activities have affected habitat quality and access. Management requires meeting basic habitat needs *and* understanding the socioeconomic value of elk. Primary considerations in elk management (Lonner 1991) include:

Maintaining habitat security to protect elk during the hunting season;

- Preserving/recovering desired elk population characteristics as determined by elk managers and distributions relative to land management;
- Satisfying the growing demand for quality hunting and non-hunting experiences.

Methodologies have evolved over the years to measure the status of elk populations and their vulnerability to land management practices, hunting, wildlife viewing, and the ever-increasing presence of people throughout elk habitat. These approaches are generally organized around seasonal habitat needs: Summer range, winter range, and hunting season security habitat.

Summer Range

Basic Elk Summer Range

From late spring through late summer, elk need secluded calving areas and summer range rich in nutritional forage. Elk move upslope following spring green-up, and calving occurs along a rough elevational gradient. While bulls often seek out the patchy interface between emerging green-up and the snowline, cows remain lower where forage is more robust. Productivity of elk is therefore based partly on the quality of transitional range as well as that of summer range.

Research suggests that the quality of summer range—via its ability to contribute to late summer nutrition—may be the most important variable in determining annual variation of herd growth (Stewart *et al.* 2005; Cook *et al.* 2002, p. 305; Cook *et al.* 1996). *Habitat Effectiveness* (Christensen *et al*. 1993) is one widely used means of summarizing how well summer and transitional ranges meet the needs of elk for growth and welfare in non-hunting seasons. Habitat effectiveness derives from the abundance and distribution of cover, forage, water, and special habitat features. Since the availability of these components tends to be satisfactory on most summer ranges, variations in habitat effectiveness are related most often to an additional factor: the opportunity to avoid human activity. Opportunity for seclusion—or the lack thereof—on the National Forest is primarily a function of open roads, which, if abundant enough, can shunt elk away from habitat sites that they would prefer to use. Open road density is translated to habitat effectiveness via a curve derived from the *Montana Elk-Logging Study* (Lyon 1979), which recommends minimum habitat effectiveness of 50% on elk summer range (or an open road density less than 2.0 mi/mi^2).

A problem with "habitat effectiveness" as an index of habitat functionality is that it measures open road density over broad areas (typically, elk herd units) without considering how roads are distributed. Roads that pass through key habitats (wet meadows, riparian areas, nursery areas, aspen stands, etc.) degrade the capability of elk summer range to a greater extent than those that traverse areas of less importance. This kind of impact on localized and sometimes poorly mapped habitat features is difficult to quantify over an area as large as the Divide landscape. Therefore, the focus was placed on impacts in local areas of particular importance to elk for which reliable field information is available (see "*Local Effects in Key Areas"*).

Helena Forest Plan standards for summer range are concerned with maintaining adequate hiding cover (big game Standards 3 and 5), protecting active elk calving and nursery sites from motorized uses (Standard 4b), and inventorying and mapping important summer range areas (Standard 7). Also

incorporated into the *Forest Plan* are recommendations of the *Montana Cooperative Elk-Logging Study* (Lyon 1985) (Standard 6), some of which apply to summer range. Applicable recommendations are to protect the integrity of wet sites, preserve key blocks of cover, minimize open road density, eliminate open roads passing through key summer habitat, and discourage project designs that introduce cattle into new areas of elk summer range. Of primary interest to the Divide travel plan are those standards that address the influence of roads on elk summer habitat. While the relationship between roads and forest cover on summer range is of interest, the travel plan would have no effect on cover.

HNF and MFWP Interpretations of Summer Range

The *Forest Plan* Glossary defines big game summer range simply as "a range, usually at higher elevation, used by deer and elk during the summer…" (*HFP,* p. VI/16). Working maps of big game range in the Divide landscape prepared for the *Helena Forest Plan* (1981) show local pockets of "key summer range" in some detail, but they do not delineate summer range as a whole. Given this deficiency, most *Forest Plan* big game analyses since the early 1980s have interpreted summer range as (1) all land inside HNF administrative boundaries, regardless of elevation, or (2) all HNF lands *not* shown as winter range on the 1981 maps. Summer range under either of these interpretations is extensive, covering true higher elevation "summer ranges" as well as lower elevation "transitional ranges" that are used mostly in spring and fall.

Therefore:

- In discussing the ecology of elk summer range in the travel planning area, the more traditional view of summer range as higher elevation habitat where most of the elk are found during the "summer"—between the time calves are born (late May – early June) and the first big frosts begin to push elk out of many key summer habitats (generally in mid-late September) was adhered to. It should be noted that this is a considerably larger area than the sum of local sites that are mapped as "key summer range".
- For purposes of determining compliance with *Forest Plan* big game standard 3, which requires maintaining 35% of summer range as hiding cover *(HFP*, p. II/17), the more expansive delineation of "summer range"—that is, *all* lands within HNF administrative boundaries within elk herd units was employed. This interpretation loops in a lot of ground that serves primarily as transitional and winter range and that is used only incidentally or occasionally in summer. But it is consistent with much of what has been done in other *HFP* analyses since 1981, and so, for the time being, it will apply here also.

Winter Range

Traditionally, the availability of suitable winter range has been seen as the key limiting factor for most elk populations (see Polfus 2011, p. 20-23; Lyon and Christensen 2002, p. 559). Winter ranges are usually smaller than summer ranges, intrinsically supply less forage, provide less forest cover, often lie closer to sources of human disturbance, are often grazed over by domestic livestock, and are occupied by elk when temperatures are low and snow may limit access to forage. Under these conditons, elk catabolize fat and muscle and may lose 25% or more of their body weight in severe winters and 10% in moderate to normal winters (Cook 2002, pp. 305-310). So, managing for wintering areas with minimal human activity and adequate forage can help reduce energy costs associated with over-winter survival (Skovlin *et al.* 2002). On the other hand, recent studies, suggest that while natural mortality is generally higher on winter ranges, the probability of elk surviving a given winter is directly linked to the quality of nutrition on spring, summer, and fall ranges (Cook 2002, p. 305).

In the Divide landscape, as well as across much of the HNF, a large proportion of elk winter range lies on private land—or other non-Forest lands—in lower elevation foothills and valleys. Big game habitat on

these lands is outside the jurisdiction and control of the National Forest. It has been delineated on broadscale maps by MFWP (with assistance from the Rocky Mountain Elk Foundation) [MFWP 2011a]. However, for purposes of assessing the impacts of HNF travel management, winter range maps developed for the HNF Oil and Gas Leasing EIS in 1995 (USDA, USDI 1995) were used. The rationale for using this version of winter range as opposed to that delineated by the MFWP maps is discussed some detail in the *"Environmental Consequences"* sections that deal with elk winter range.

In this analysis, the status of winter range is discussed as a whole—including the large private land component. But, because the HNF is unable to manage much of this resource directly, only winter range within Elk Herd Unit boundaries (an area reaching 1.5 mile beyond the Forest boundary) was used to calculate Forest Plan standards. This accounts for most elk that remain linked to National Forest lands in winter (potentially moving back and forth between public and private land) and that might be influenced by HNF land management during this period.

Helena Forest Plan standards for elk winter range focus on two things: (1) providing adequate thermal cover (stands of trees ≥40 ft high with at least 70% canopy closure) and (2) restricting disturbance from motor vehicles. Thermal cover in stands larger than 15 acres needs to account for at least 25% of winter range in each elk herd unit, and vehicle traffic through elk wintering areas is to be restricted to those few primary roads and snowmobile trails needed to access other parts of the Forest. Interestingly, the *Plan* does not address forage on winter range.

For several decades, *thermal cover* has been one of 2 pivotal habitat elements at issue on big game winter ranges (forage being the other). In winter, thermal cover stands curtail snow accumulation, block wind, and, under the right conditions, moderate temperature under the canopy. However, the value of thermal cover—widely accepted as a key component of elk winter range in the 1970s and 1980s (Thomas 1979; Beall 1976)—has been called into question by more recent research (Skovlin *et al*. 2002). Cook *et al.* (1998) found no positive effect of thermal cover on the condition of elk in a series of experiments in northeast Oregon and concluded that providing thermal cover was not a suitable solution for inadequate forage on winter range. A review of experimental tests aimed at probing the value of thermal cover to big game animals (Cook *et al.* 2005) concluded that the thermal cover benefit attributed to dense forest structure was probably not operative across a considerable range of climate, including most elk winter ranges in Montana.

Recently, however, Thompson and others (2005) have made a case for the importance of forest cover on Montana elk winter ranges. They argue that elk benefit from solar radiation in open habitats only as long as forage is adequate and accessible—as is the norm in most winters. But when forage is scant or access to it is impeded by deep or crusty snow, elk use up stored energy reserves at a higher rate, and the metabolic cost of remaining in open grassland or shrubland becomes too high. In those cases, elk switch to an energy conservation strategy, moving to forest cover, becoming less active, and subsisting on low quality forest forage.

The forest configuration advocated by Thompson *et al.* is not the classic continuum of >70% canopy closure, but rather, a cover/forage mosaic where patches of dense cover are intertwined with more open-canopied forest and small openings. This provides an environment where manageable snow conditions and useful forage [deciduous shrubs, elk sedge, young conifers (esp. Douglas-fir), and arboreal lichens—species that thrive in more open forest conditions] are in close proximity. Thompson *et al.* (2005) provide no shorthand descriptive term for this habitat formation; but it is not "thermal cover".

Field monitoring by MFWP biologists has shown that even when elk spend daylight hours foraging in open grasslands, they most often retreat to these kinds of mature forest stands to bed down at night. Bulls in particular spend a considerable amount of time in forested habitats adjacent to open foraging areas. The stands need not be large—often riparian stringers and small isolated forest patches serve the purpose.

But, the dominant trees are almost always mature (T. Carlsen, A. Grove: personal communication 2012). Again, these stands need not meet the definition of "thermal cover", and many of them are relatively open.

More to the point for this assessment, the need to limit human disturbance on elk winter range has been validated by ongoing research (see Polfus 2011; Canfield *et al.,* p. 6.3-6.9; Lyon 1979). While elk can tolerate a certain amount of vehicle traffic limited to predictable, well-defined routes—either by habituation or by avoidance of the road/trail corridor—random off-route travel will haze elk from normal wintering sites, leading them to draw down limited energy reserves. In this regard, Forest Plan standards remain valid.

Fall Elk Security

Introduction

Elk management during the hunting season focuses on maintaining population numbers well above viability thresholds, protecting certain sex and age classes from over-harvest, providing public hunting opportunity, and attempting to balance elk distribution across public and private lands. While these functions are a responsibility of Montana Fish, Wildlife and Parks (MFWP), the HNF strives to compliment their efforts by managing elk habitat on the National Forest. The goal has been to provide security habitat that allows a reasonable number of elk to escape hunters so that MFWP does not have to reduce the allowable harvest or shorten the hunting season (USDA 1986). The current 5-week season (much longer than in most states and provinces) "permits a diversity of choice (for hunters) with regard to time, weather conditions, hunter density, and area" (Lonner and Cada 1982 cited in Hillis *et al.* 1991).

Helena Forest Plan Approach

The current *Helena Forest Plan* standard for measuring elk security/vulnerability in the hunting season [Big Game Standard 4a (*HFP,* p. II/17 – II/18)] uses an index that combines open road density and hiding cover. In computing the standard, road miles are "weighted": Open roads on National Forest and other public lands are calculated at 100% of length and private roads at 25% of length. Forest roads closed to vehicles during the hunting season are not counted (USDA 2007e). The *Forest Plan* requires that in order to be tallied for Standard 4a, hiding cover must occur in blocks of 40 acres or more ("*Forest Plan* hiding cover") (see Standard 5, *HFP* p. II/19). Hiding cover is defined as vegetation capable of concealing 90% of a standing elk at 200 feet (the "Forest Service definition"). Obtaining this measurement over large areas (such as elk herd units) is an arduous and time-consuming process. So, for the sake of practicality, we use *canopy closure* (*"crown closure")* as derived from aerial photos and satellite imagery as a surrogate for hiding cover—based on the assumption that stands with canopy closure of 40% or more will also provide hiding cover. Standard 4a allows for this alternate methodology (the "MDFWP definition") and sets the following open road density limits for given hiding cover percentages (*HFP*, p. II/18)—a relationship which is shown graphically in Figure 3.1.

Table 3.45 The max. open road density allowed for a given level of hiding cover as set by *Forest Plan* Big Game standard 4a (*HFP,* p. II/18). In this analysis, we use the MDFWP definition of hiding cover.

% Hiding Cover required when using USFS definition	% Hiding Cover required when using MDFWP definition	Max. Open Road Density for the given level of hiding cover
56 %	80 %	2.4 mi/mi^2
49 %	70 %	1.9 mi/mi^2
42 %	60 %	1.2 mi/mi^2
35 %	50 %	0.1 mi/mi^2

The following figure provides a graphic representation of the relationship between maximum open road density and MDFWP percent hiding cover shown in Table 3.45. In determining compliance with standard 4a, hiding cover and open road density are plotted for individual elk herd units (EHUs) [elk herd units are discussed in a following section]: points that fall below the curve comply with standard 4a; points above the curve are out of compliance.

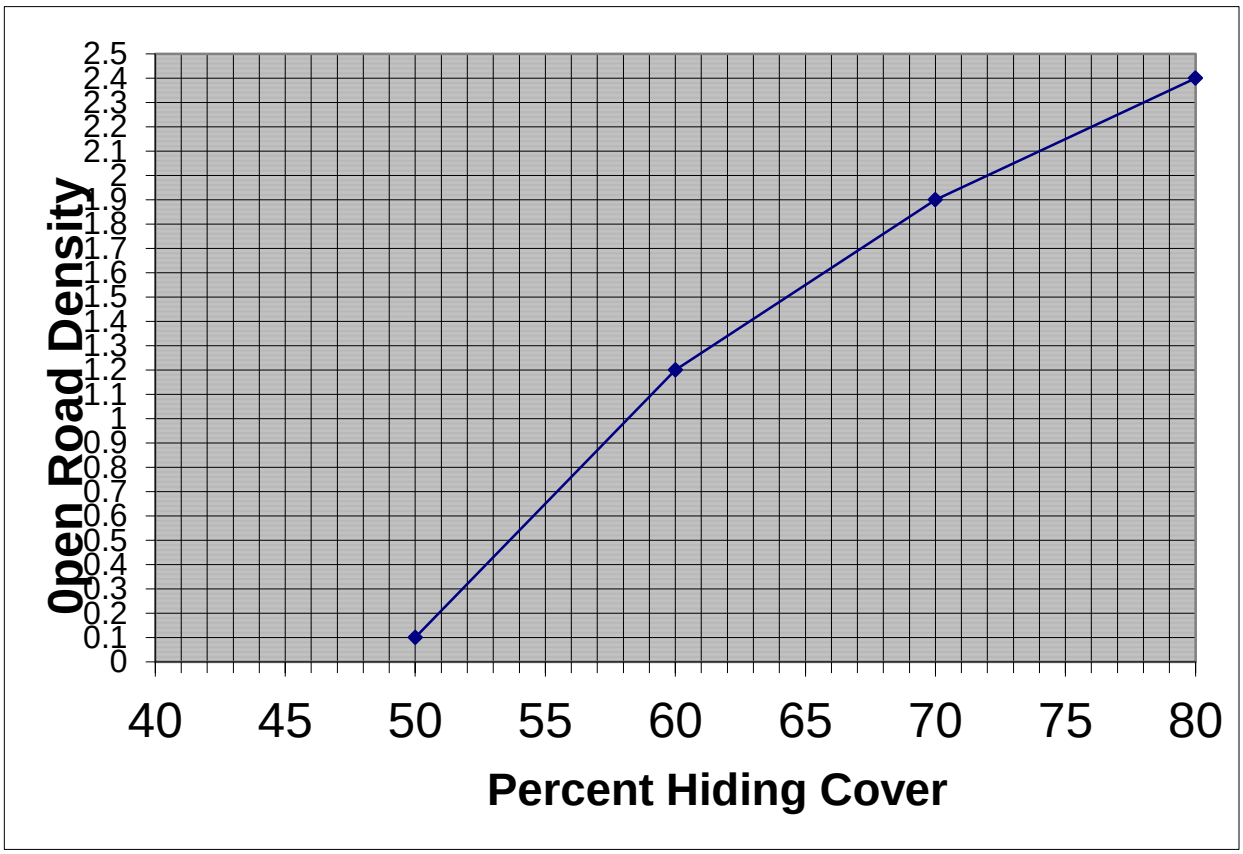

Figure 3.1 Maximum ORD and % Hiding Cover

Table 3.46 shows the current status of the 6 elk herd units (EHUs) in the Divide landscape with regard to percent hiding cover, weighted open road density, and consequent compliance with Big Game Standard 4a.

Table 3.46 Current hunting season open road density and percent hiding cover within Divide elk herd units (EHUs)—and implications for compliance with *Forest Plan* Big Game Standard 4a.

Elk Herd Units	EHU Total Acres	*FP* Hiding Cover Acres	Percent *FP* Hiding Cover	Open Road Miles in Fall	Open Road Density (mi/mi²)	Meets *FP* Std 4a?
Little Prickly Pear—Ophir	87,022	40,222	46 %	220	1.6	No
Greenhorn	56,314	16,871	30 %	155	1.8	No
Spotted Dog—Little	82,314	48,306	597 %	148	1.2	No

Elk Herd Units	EHU Total Acres	*FP* Hiding Cover Acres	Percent *FP* Hiding Cover	Open Road Miles in Fall	Open Road Density (mi/mi²)	Meets *FP* Std 4a?
Blackfoot						
Jericho	35,345	23,091	65 %	68	1.2	Yes
Black Mtn—Brooklyn Bridge	56,339	29,260	52 %	166	1.9	No
Quartz	36,733	16,477	45 %	62	1.1	No

Five of the 6 herd units are presently out of compliance with the Forest Plan standard for big game security (having plotted out above the curve shown in Figure 3.1). The one herd unit that does comply with the standard (Jericho) has substantially more hiding cover than most of the other units. The two herd units with the lowest open road densities (Quartz and Spotted Dog–Little Blackfoot) do not comply with the standard because of insufficient hiding cover (although it would seem that cover levels of 45% and 59% in those units would provide a servicable amount of security). So, it appears that compliance with this standard is more a function of hiding cover than of open road density. And while open road density can be quickly reduced by closing roads, increases in hiding cover are generally the product of a long, slow natural process that cannot be manipulated in the short term. In the meantime, hiding cover across the landscape is decreasing further as trees killed in the recent mountain pine beetle outbreak continue to come down across much of the travel planning area.

While the relationship between open road density and hiding cover can be informative, it does not account for the spatial arrangement and size of unroaded patches, topography as a mediator of hunter access, the distribution of forage, and other factors that influence the ability of elk to survive the hunting season. Forest stands that do not meet the definition of hiding cover may prove to be secure areas for elk where local conditions of topography, remoteness, and environmental barriers impede hunter access. Conversely, blocks of hiding cover situated in roaded country may be highly insecure. Hiding cover has a role to play but it is not synonymous with security (Lyon and Canfield 1991; Unsworth and Kuck 1991; Lyon and Christensen 1992; Christensen *et al.* 1993).

When the *Helena Forest Plan* was being fashioned in the early 1980's, the total elk population on the Forest was estimated to be around 5,000 (4,900 elk in 1981) (*HFP,* p. V/5). Goals, objectives, and standards for big game in the *Plan* were designed, among other things, to provide enough habitat on the National Forest to support 6,400 elk by 2000—in support of MFWP goals for harvestable elk (*HFP,* p. V/5). Currently, MFWP aerial survey data indicate that at least 13,940 elk inhabit hunting districts that overlap the Helena National Forest. While some of the elk in these hunting districts spend all or part of their time on non Forest land or on the Beaverhead-Deerlodge and Lewis and Clark NFs, a substantial number of them—well in excess of 6,400—are part of the Helena NF population. Nonetheless, while elk populations in the Divide landscape have increased substantially since the 1980's and have been at or above MFWP population goals over the past several years—as well as exceeding Helena NF population goals—the Big Game Security Index (big game Standard 4a) continues to indicate that elk security for most of this area is sub-standard. In a word, the index has been an imprecise and often uninformative guide to the state of fall elk security over the past 25+ years [see *"Background Information for the Forest Plan Amendment of Big Game Security Standards"* (Project Record)].

The Concept of Elk Security Areas

Since the release of the *Helena Forest Plan* in 1986, field reseach in the northern Rockies and Pacific Northwest has led to the concept of "*elk security areas"* as a basis for assessing elk vulnerability to hunting. The degree to which elk are able to survive the fall hunt is seen, in large part, as a function of the size and pattern of habitat blocks, amply forested in most cases, to which hunter access is limited and in which elk have consistent, unencumbered access to basic resources. Hillis and others (1991) developed an analysis procedure (generally referred to as the "Hillis method") based on the availability of large non-linear blocks of habitat (≥250 acres) ½ mile from open roads. As a rule of thumb, Hillis *et al.* recommended that at least 30% of the "hunting season home range" within a "standardized habitat analysis unit" be held in security areas (Hillis *et al.,* p. 39). Hillis cautioned, however, that this particular set of parameters was designed for densely-forested western Montana elk habitat (much of the field research on which it was based having been done in the lower Clark Fork drainage and in the Sapphire and Garnet Mountains). As a result, Hill recommended that—particularly for areas further east where forest cover may be limited—security requirements should be evaluated on a site-specific basis and the guidelines adjusted so that results make biological sense in a local setting (Hillis *et al.* 1991, p. 40; Christensen *et al.* 1993, p. 5).

The security area approach is discussed in more detail below and in "Background Information for the Forest Plan Amendment of Big Game Security Standards" (project record).

Forest Plan Amendment for Big Game Security

Under a *Forest Plan* amendment proposed for the Divide travel plan—and applicable to future projects in the Divide landscape—a "security area" approach would replace the current "big game security index" (the hiding cover/open road density index) as the *Forest Plan* standard for gauging the vulnerability of elk to hunting [see the *Forest Plan Amendment for Big Game Security for Divide Travel Planning* (*EIS, Appendix D*)]. The amendment derives from the Hillis methodology (1991) and adopts specific guidelines for its application from "*U.S. Forest Service and Montana Department of Fish, Wildlife and Parks Collaborative Overview and Recommendations for Elk Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests"* (USDA and MFWP 2013). [This document offers 10 detailed recommendations designed to provide consistency in the way that "eastside" Forests revise their Forest Plans with regard to big game habitat management.]

Key recommendations with regard to elk security include the following:

- "Security areas should be well-distributed within the fall herd home range on NFS lands (not all concentrated at high elevations or in wilderness) to account for movements due to weather throughout the hunting season; generally high elevation areas that are above tree-line or steep (>80% slope) areas that are not used by animals will not be considered occupied elk habitat and will not be considered part of the fall herd home range. However, at the project level, there may be examples where steep or cliff-like areas may serve to deter hunters and therefore contribute to security."
- "When at least 30% of the mapped fall portion of the elk analysis unit on National Forest System lands consists of security areas (generally larger than 250 acre blocks, which are at least ½ mile from an open motorized route), and overall MDFWP objectives (population, harvest, distribution, etc.) for elk are met, FS project activities shall not reduce security below 30%."
- "When security is less than 30% and overall MDFWP objectives for elk are met, project activities shall not reduce the existing security level and, in addition, consideration will be given to minimizing impacts on existing functional cover within those security areas."
- "When MDFWP objectives for big game are *not* being met (at existing security area levels either above or below 30%), MDFWP and FS biologists shall jointly develop specific strategies to address

the situation (via Hillis et al. 1991), which may include managing for a higher percentage of the fall herd unit that provides security (e.g. 50%), increasing the size minimum of security areas, or increasing the minimum distance of security areas from open motorized routes e.g. 1 mile). This discussion may also conclude that the issue is not habitat related. Where such measures are deemed to help meet MDFWP objectives, project activities related to travel and vegetation manipulation should be designed to address these specific strategies."

The proposed programmatic amendment an interim measure prior to full revision of the *Forest Plan* (slated to begin in 2014) and it does not incorporate all of the detail in the above recommendations. It does, however, adhere to the core concepts. The precise wording of the amendment is presented in the "*Environmental Consequences"* section of this report (*"Big Game Security: Proposed Forest Plan Standard")*.

Delineating Elk Security in the Divide Landscape

For this analysis[5], elk security areas have been identified wherever they occur on *fall home range* (also referred to as *hunting season home range*) within the six *elk herd units* of the Divide landscape (see *"Elk Herd Units"* in the following section). Herd units along the HNF administrative boundary have been delineated to extend 1.5 mile out onto non-Forest land, and security habitat has been identified in this non-Forest zone as well as on the Forest. In calculating the percent of the herd unit that provides security, however, only the area within HNF administrative boundaries was done (as recommended by the FS/MFWP working group (USDA and MFWP 2013)). This is where MFWP and the HNF would like to retain elk in the hunting season: that is, public land open to all hunters—and an area where the Forest Service has management control and the ability to close roads.

By excluding from the security calculation those portions of the herd units that lie outside the Forest boundary, security areas provided by private lands on which public hunting is barred and on which elk have learned to seek refuge were not included. MFWP and the HNF feel that relying on these sanctuaries for security is undesirable since it decreases public hunting opportunity. In addition, the status of private lands tends to be somewhat in flux over the long term, depending on landowner decisions that may have little consideration for the welfare of elk. So, the role that these lands play in influencing elk security on the National Forest was considered as a cumulative effect, it was not analyzed as a direct effect on HNF land.

In setting out to delineate "hunting season home range", it was discovered that the hunting season was capable of encompassing such a wide range of vegetation conditions, weather events, and snow accumulation, that there were few areas within the herd units that elk might not use under one set of circumstances or another from late summer through late fall. In each case, therefore, the entire herd unit was classified as potential hunting season home range—recognizing that there was a high probability for variation in use between years and that only part of this area would be available or attractive to elk at any given time.

Delineating security areas began with standard Hillis habitat blocks—at least 250 acres in size with all borders at least ½ mile from open roads and motor trails. Each potential security area was then evaluated with regard to a variety of factors that might make it more or less effective. Factors that might diminish the integrity of a security area include the following:

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[5] The methodology used to delineate elk security areas in this initial report is subject to change in future analyses. Ongoing discussions between Helena NF and MFWP biologists are in the process of developing a standard approach to defining elk security in "eastside" Forests. The final version of this analysis will follow the recommendations of that group [expected in early 2014].

- small size (250-400 acres),
- narrow or irregular shape (lots of edge),
- gentle terrain (which encourages hunters to probe further into the area),
- limited elevational range (which limits elk use to only part of the hunting season),
- deficient or highly fragmented forest cover,
- few interior foraging areas (which forces elk to leave the security area to find food),
- isolation from other security areas (no credible travel corridors between areas),
- an interior network of closed roads and trails (providing walking lanes for hunters),
- proximity to local population centers (which generally leads to high hunting pressure),
- multiple entry points (trailheads, roadside pullouts, parking areas).

Factors that tend to increase the integrity of security areas are the converse of those listed above. Application of these factors to the Divide landscape has, in many cases, served to increase the distance of security area boundaries from open roads (generally by an additional 0.25 – 0.50 mi)—thus decreasing what is classified as security habitat. Changes were site-specific—applied only to the section of security area boundary affected by a particular factor or set of factors, and not to the entire perimeter. In the case of small areas, if factors dictated shrinking the size of the security area to 300 acres or less, it was eliminated as a bonafide security area.

Conversely, where rugged terrain (steep rocky slopes, cliffs) or other physical barriers (streams, ponds, bogs, dense blowdown) along security area perimeters were known to thwart hunter access, the boundaries were moved closer to open roads. On private land primitive road systems that are off-limits to public hunting were considered to be closed roads for purposes of defining security. The key issue in this instance is the degree to which hunters are able to access fall elk range and kill elk, rather than the potential for disturbing or displacing animals by vehicles not involved in hunting (see *Appendix G of the Wildlife Specialists Report* for a detailed summary of boundary adjustments).

Environmental factors may, in some cases, allow areas smaller than 250 acres to provide useful security—at least temporarily. Elk have been observed using smaller habitat blocks to successfully elude hunters throughout the Divide landscape over the years. Habitat components that can enhance security in these smaller areas include dense vegetation, heavy deadfall, rough terrain, difficult water crossings, consistent snow and ice accumulation later in the hunting season, general remoteness, and so on. While these factors have been accounted for in discussing the effectiveness of elk security in different herd units, they were not used to justify the addition of areas less than 250 acres in size to the total security acreage. Rather, to these sites are referred to as “local refuges” or “temporary escape zones” and sometmes note their general abundance and distribution—as they help to explain the effectiveness of elk security in some herd units that are near or below the 30% threshold recommended by Hillis *et al.*

Another factor contributing to elk security is land ownership pattern. In recent years, more elk have been finding fall refuge on large blocks of private land off the National Forest. This occurs when ranchers or other owners of large parcels near the Forest prohibit or restrict public hunting. These limitations result from landowners losing patience with hunter behavior on their lands or from a shift in landowner attitudes (often among new residents) to one that values elk as an intrinsic natural resource to be left to its own devices rather than a game animal to be hunted. In parts of the Divide landscape (the Spotted Dog country being a prime example), elk have been quick to identify the security value of these private lands. A recent study by MFWP concluded that, given the choice, elk prefer unhunted sanctuaries on private lands to traditional security areas on public land (MFWP 2011c; Proffitt *et al.* 2010, 2013) (see also Burcham *et al.* 1999).

The impetus to move to private land prior to or early in the hunting season may be driven by inadequate security and/or an overabundance of hunters and motorized recreationists on public lands. Later in the season it may be generated by accumulating snow and scarce forage. At any rate, these private sanctuaries are acting as valleyland and foothills "security areas" that augment security (as defined by Hillis *et al.*) on public land. With private land, however, hunter access is often completely precluded rather than simply made more difficult by walking distance and terrain as with National Forest security areas [see discussion of the Deerlodge and Granite Butte EMUs in the *Montana Elk Management Plan* (MFWP 2004), pp. 187-203]. Because most private refuges are at lower elevation, they may come into play later in the hunting season when National Forest security areas—most of which are situated at mid to high elevation—may become unavailable to elk as snow accumulates in the mountains. Regardless of how it is provided, vulnerability/security of elk during the hunting season is, in most years, an important factor affecting the size and composition of elk populations in the Divide landscape.

Table 3.47 summarizes the current contribution of HNF lands to elk security, using both the original Hillis methodology and an assessment based on local area adjustments.

Table 3.47 Elk Security during the big game rifle season (Oct. 15 – Nov. 30) for elk herd units (EHUs) within HNF administrative boundaries.

Elk Herd Units	**EHU Acres within HNF Boundaries**	**Acres in *Hillis* Security Areas**	**Acres in *Adjusted* Security Areas**	**% of EHUs in *Hillis* Security Areas**	**% of EHUs in *Adjusted* Security Areas**
Little Prickly Pear – Ophir	59,310	15,433	14,201	26 %	24 %
Greenhorn	21,693	3,837	3,433	18 %	16 %
Spotted Dog – Little Blackfoot	63,561	30,275	28,880	48 %	45 %
Jericho	29,363	9,175	8,753	31 %	30 %
Black Mtn – Brooklyn Bridge	35,873	14,872	13,983	42 %	39 %
Quartz	23,036	6,682	7,038	29 %	31 %
Divide Total	**232,836**	**80,284**	**76,208**	**34 %**	**33 %**

Acreages and percentages are for the entire Divide landscape—not just the portions of EHUs in the travel planning Area. "Hillis" security areas are **habitat** blocks ≥250 acres at least ½ mile from motor routes. "Adjusted" security areas have been modified in size and shape (and sometimes eliminated) based on a variety of local on-ground conditions.

Table 3.47 shows that, using either "Hillis" or "adjusted" security areas, the 4 herd units south of U.S. Highway 12 (Spotted Dog – Little Blackfoot, Jericho, Black Mtn – Brooklyn Bridge, and Quartz) are above or close to the 30% security area threshold recommended by Hills *et al.*(1991). The 2 units north of Highway 12 (Little Prickly Pear – Ophir and Greenhorn) are below the threshold—Greenhorn being well below at 16% adjusted security. On both units, however, elk are able to compensate for sub-par security on HNF lands by taking advantage of private lands where public hunting is not allowed or where access is difficult. At this point, a methodology has not been developed for quantifying the contribution that these private sanctuaries make to elk security on HNF land other than where they connect directly to National Forest security areas in the 1.5 mile-wide herd unit extension beyond the Forest boundary.

Elk Herd Units

To analyze the effects of HNF actions on elk, the Divide landscape has been partitioned into 6 *elk herd units (EHUs)* [*Wildlife Specialists Report, Appendix F,* Map 1]. Elk herd units include all lands within HNF boundaries, public and private, and adjacent land out to 1.5 miles beyond the boundary (mostly private holdings, but some BLM and State land). This extension delineates an off-Forest area used by elk that remain dependent on the National Forest throughout the winter (often returning to the Forest to bed after foraging in off-Forest grasslands). The delineation excludes areas occupied by elk that move well away from the Forest for the duration of the winter. EHUs are used to calculate compliance with Forest Plan Big Game standards 2, 3, and 4a (*HFP*, pp. II/17-18).

Current EHUs in the Divide landscape were delineated in 2003 by HNF and MFWP biologists and modified in 2007 and 2011. Two modifications were made: (1) the addition of the 1.5 mile zone beyond the Forest boundary to better represent the influence of Forest management on wintering elk (2007) and (2) the merging of the Spotted Dog and Little Blackfoot herd units into a single unit to better reflect how elk groups intermingle in that area in summer and fall (2011).

Herd units are designed to encompass areas occupied by relatively cohesive groups of elk on the National Forest. The delineations are imperfect, however, for a number of reasons: (1) herd units are mapped as discrete areas, whereas elk herd home ranges often overlap; (2) mapped herd unit boundaries are fixed, whereas elk ranges on the ground may be fluid from one year to another; (3) some groups of elk within a herd may occupy one mapped herd unit in summer and another in winter; (4) the delineation of what constitutes a unified “elk herd” or “herd unit”, or “herd group” is often difficult to pin down—and mapped herd units may differ in size and pattern depending on the idiosyncrasies of the mapper and the quality of the field data; (5) yearlong elk ranges often run well beyond National Forest boundaries, and for purposes of analyzing the impacts of Forest management, herd unit boundaries need to be cut off at some point near the Forest boundary—often well short of where elk may actually go in some winters.

For these reasons, a case can be made for using terms such as “elk analysis unit” or “elk analysis area” to identify the fixed, discrete areas that the HNF has mapped out for purposes of assessing elk habitat, and reserving the term “elk herd unit” to describe the dynamic groupings of elk that management agency biologists have identified through long-term field observation. For the time being, however, in order to maintain a certain consistency, the term “elk herd units” will continue to be applied to these HNF elk assessment areas.

In the Divide landscape, most EHU boundaries have been drawn along primary drainage bottoms so that the EHUs encompass cohesive summer ranges at higher elevation. Before 2003, most herd unit boundaries had followed major ridgelines, thus splitting the areas used by elk herd groups in summer. In winter, elk that have spent the summer in a given herd unit on the National Forest may diverge onto two or more non-Forest winter ranges, where they mingle with elk that have summered on other herd units (G. Joslin, pers. comm. 2003). Summer range centered units thus seemed a more accurate characterization of elk activity on HNF ground.

Current herd units in the Divide landscape are quite large compared to those used prior to 2003 and those in use on several other Forests in Region 1. Pre-2003 Divide herd units were the size of timber compartments—roughly 4,000-12,000 acres—whereas present-day Divide units range from around 35,000 acres to 87,000 acres (Table 8, p. 50). This brings them into line with herd units in the Elkhorn and Big Belt landscapes. These units may encompass the ranges of two or more smaller elk “herd groups”. Because the movements of these smaller groups on summer and transitional ranges may be difficult to map with any consistency from year to year (without radio telemetry data), the larger, stable units make more sense for habitat analysis.

The travel planning area takes in parts of six elk herd units in the Divide landscape: The Plan Area does not include the 1.5 mile extension beyond HNF boundaries or National Forest land covered by previous travel planning efforts. These include the Clancy-Unionville area (much of the Quartz and Black Mountain – Brooklyn Bridge EHUs) and most of the upper Little Prickly Pear drainage (half of the Little Prickly Pear–Ophir EHU). *Forest Plan* compliance, however, is calculated for entire elk herd units, not just on the portions that fall within the travel planning area.

In Table 3.48, "Total Acres in EHU" includes all public and private land within administrative boundaries of the HNF plus the 1.5 mile extension out onto non-Forest land. The category "EHU Acres within HNF Administrative Boundaries" is larger than "Total Acres of HNF land within EHU" due to non-Forest inholdings inside the administrative boundary. These two categories indicate the proportion of each EHU over which the HNF has management control.

Table 3.48 Elk Herd Unit (EHU) Acreages in the Divide Landscape.

Elk Herd Unit (EHU)	Total Acres in EHU	EHU Acres within HNF Boundaries	Total Acres of HNF land within EHU	% of EHU in Divide Travel Plan Area
Little Prickly Pear – Ophir	87,022	59,310	49,725	50 %
Greenhorn	56,314	21,693	19,914	39 %
Spotted Dog – Little Blackfoot	82,314	63,561	47,261	80 %
Jericho	35,345	29,363	23,521	83 %
Black Mtn – Brooklyn Bridge	56,339	35,873	34,010	26 %
Quartz	36,733	23,036	18,235	13 %
Divide Total	**354,067**	**232,836**	**193,090**	**50 %**

LITTLE PRICKLY PEAR–OPHIR Elk Herd Unit

The Little Prickly Pear – Ophir Creek herd unit straddles the Continental Divide south of the Helena/Lincoln RD boundary. It covers the upper reaches of the Little Prickly Pear Creek watershed east of the Divide and the headwaters of the greater Dog Creek and Ophir Creek drainages west of the Divide. Prior to 2003, the HNF recognized 2 herd units in this area ("Ophir" west of the Divide and "Little Prickly Pear" east of it). Regular movement of elk across the Divide in summer and fall, led MFWP to suggest merging the 2 units in 2003. The resulting Ophir – Little Prickly Pear EHU is now the largest in the Divide landscape at 87,022 acres. About 37,300 acres (43%) of the EHU are in private or other non-Forest ownership.

Much of the northern half of the unit (mostly east of the Divide) is in unroaded country that abuts the Nevada Creek Roadless area on the Lincoln District to the northwest. As a result, elk security in this half of the unit is quite good—well in excess of 30%. Hunters are aware of the high fall elk density in this roadless country, and a substantial number of them push into the area on foot or horseback during both the bow and rifle seasons, and with a certain degree of success. This is the kind of area that MFWP feels is producing a "high-quality hunting experience". Security west of the Divide, however, is less than 20% because of heavy roading, particularly in the Dog Creek drainage. Shortly after the start of the rifle season, elk in this area retreat to a limited number of enclaves—the largest being the block of unroaded country south and west of Black Mountain. Overall, 24 % of the area within HNF boundaries in the Little

Prickly Pear–Ophir EHU is occupied by effective elk security areas (Tables 3.47, 3.49). Elk do make use of a number of smaller unroaded enclaves for temporary refuge—in particular, in forested sites around Esmeralda Hill, LaSalle Gulch, Cellar and Ogilve Gulches, and Spring Gulch.

Summer habitat effectiveness (based on open road/ motor trail density) shows a similar pattern: Very high in the Little Prickly Pear watershed east of the Divide, considerably lower west of the Divide. Overall habitat effectiveness is 65%—well above the recommended minimum of 50%. The non-motorized portion of the Little Prickly Pear watershed is particularly effective as summer habitat. One of the only "large" burns to have occurred in the Divide landscape in the past few decades is located here in Beartrap Gulch and the South Fork of Little Prickly Pear Creek. It dates from the 1960s, and while it retains few snags, it provides excellent summer foraging opportunities for elk. Mule Deer, black bears, and grizzly bears also make use of the burn in summer. GIS modeling estimates that 46% of the EHU provides hiding cover (Table 9).

Bonafide winter range [see the HNF Oil and Gas Leasing EIS (USDA, USDI 1995)] is limited to the northern end of the EHU around Cayuse Ridge and Ogilve Gulch and to private ranchlands in the broad valleys of Little Prickly Pear Creek and its tributaries to the east. Elk utilize the HNF portion of the "winter range" primarily as transitional range in spring and fall but may remain through part of the winter if snow conditons allow.

GREENHORN Elk Herd Unit

The Greenhorn EHU lies astride the Continental Divide. Roughly 80% of it is on the east side of the Divide in the upper Tenmile and Silver Creek drainages. The west side is drained by tributaries of Dog Creek. The EHU encompasses MacDonald, Priest, and Mullan Passes—all primary cross-over corridors for big game animals and humans. Although the EHU occupies 56,314 acres, approximately 36,400 acres (65%) are in private or other non-Forest ownership. The acreage of National Forest land in this EHU is the smallest in the Divide landscape.

Much of the unit is at high elevation along the Divide and serves as elk transitional range (mostly spring) and to a lesser extent as summer range. Although summer habitat effectiveness, as indicated by open road density, is good overall (74%), elevated levels of human activity associated with the 3 passes (each with a primary road running through) and widespread livestock grazing tend to suppress summer use potential. The unit supports broad grasslands along the Divide and down the west slope, and elk graze through these areas conspicuously in spring before levels of human use begin to rise and cattle arrive. GIS modeling estimates that hiding cover occupies about 56% of EHU summer range (which makes up only about 54% of the unit) (Table 3.49). Hiding cover on the unit as a whole is only 30% (Table 3.46).

Effective elk security areas ("adjusted" security areas in Tables 3.47 and 3.49) occupy only about 16% of the area within HNF boundaries—with the unroaded areas concentrated between Greenhorn and Sweeny Creeks, around Greenhorn Mountain, and in the upper Little Porcupine drainage. Smaller, less effective security enclaves are situated in upper Greenhorn Creek, upper Blue Cloud Creek, Rich Spur Gulch, and around Priest Pass, among other sites. The lower elevation segments of the herd unit east of the Divide, between Sweeny and Greenhorn Creeks, provide some winter range, but most winter use occurs off the Forest on both sides of the Divide.

SPOTTED DOG–LITTLE BLACKFOOT Elk Herd Unit

The Spotted Dog – Little Blackfoot EHU is a complex unit. It is situated west of the Continental Divide in the upper Little Blackfoot watershed and occupies a large area between Telegraph Creek to the east and the HNF boundary to the west. It includes the headwaters of the Little Blackfoot River (the Electric Peak Roadless Area), which covers roughly 28,000 acres in the southern part of the unit. The herd unit was formed in 2011 by merging two smaller units (the Spotted Dog and Little Blackfoot EHUs) because of the

tendency of elk herd groups to move back and forth between the 2 areas in summer and fall. It is now the second largest herd unit in the Divide landscape, covering 82,314 acres of public and private land.

Currently, 31% of the herd unit is in non-Forest ownership. About 5,750 acres are in private inholdings on the National Forest and another 20,075 acres in private and State ownership in the 1.5 mile extension beyond the Forest boundary (most of it private). The western part of the herd unit extends into the 38,000 acre Spotted Dog Wildlife Management Area (WMA) established by the State of Montana in 2010 following the purchase of a large private holding. In addition to the 1.5 mile herd unit extension into the WMA, another 3,700 acres of newly acquired State land within the HNF boundary is also part of the management area. Most of the old road system in the WMA is off-limits to public vehicle traffic yearlong, and this contributes to the quality of big game security and habitat effectiveness in the herd unit.

MFWP seasonal range maps show the eastern quarter of the EHU as potential winter range. However, MFWP aerial surveys (late winter or early spring) over the last 15 years, HNF field observations, and relocations of radio collared elk (1983-1997) demonstrate that these sites centered on the broad grasslands atop Baldy Ridge and on the ridges south of Elliston are being used as spring/fall transitional range and as summer range, but not as wintering areas. Aside from the presence of a few isolated individuals early and late in the season, there is no evidence of winter use. Virtually all true winter range associated with this herd unit occurs off the National Forest on private and State land to the west and north where winter foraging habitat is extensive and not limiting (at least under current circumstances) See the discussion of elk winter range in the *"Environmental Consequences"* section.

Most of the Spotted Dog–Little Blackfoot herd unit functions as elk summer range. In the west half of the unit, the best habitat is concentrated around the heads of stream tributaries that drain the area in all directions. The eastern half of the EHU includes much of the headwaters of the Little Blackfoot River and greater Telegraph Creek—virtually all of it summer range for elk, mule deer, moose, black bears, lynx, coyotes, mountain lions and others. It is amply forested—most typically by mature lodgepole pine that originated with stand replacing fires around 1900. Much of the forest canopy in these stands is dying from mountain pine beetle infestation—although stands dominated by smaller diameter trees often manage to resist the beetle. Productive wet habitat occupies the headwaters of the unit's multifarious streams, but large wet meadows are limited—some of the most conspicuous being located in upper Ontario and Bison Creeks, around Slate Lake, and at Blackfoot Meadows near the origin of the Little Blackfoot.

There has been considerable timber harvest around Treasure Mountain and along Ontario and Telegraph Creeks, as well as in the upper Spotted Dog drainage to the west—all with attendant road systems. But, because of the extent of the Roadless Area, overall habitat effectiveness is very good at 72%. Habitat effectiveness in the Roadless Area (including that in the extensive unroaded country to the immediate south on the Beaverhead-Deerlodge NF) is 100%. GIS modeling estimates that 59% of the EHU provides hiding cover (Tables 6, 9), although this percentage is beginning to decline as beetle-killed lodgepole pine comes down over thousands of acres. This lost cover will be replaced eventually by natural regeneration of the pine forests, but it is a process that will take 20-30 years to run its course.

Montana Fish, Wildlife and Parks biologists recognize the Spotted Dog and upper Little Blackfoot country on the HNF, along with adjacent private and State land to the west (much of it in the Spotted Dog Wildlife Management Area), as a fertile area for elk [the northern part of Hunting District 215]. Winter surveys in the last decade have typically 400-500 elk west of the National Forest in this region (R. Vinkey, personal communication, 2005-2008). The 2010 and 2011 surveys counted over 1,000 elk in this area (MFWP *Elk Surveys in HD 215, 2010- 2011)*.

The Spotted Dog – Little Blackfoot EHU affords excellent security for elk through as much of the hunting season as snow conditions allow. Currently, effective elk security areas occupy 45.3% of fall elk range.

The largest block of security is associated with the Electric Peak Roadless Area in the southern half of the unit. Most problems with elk security involve lower elevation security habitat that comes into play after elk have been forced out of higher elevation roadless areas by snow and deteriorating forage later in the hunting season. Cover and road density is at issue in the Negro Mountain, Treasure Mountain, lower Telegraph Creek, and Spotted Dog Creek areas (see local area assessments in *"Local Effects in Key Areas"* toward the end of this report).

In addition to taking advantage of security habitat on the National Forest, many elk, beginning in September, drop down into the Wildlife Management Area immediately west of the Forest. Until recently, most of this land (about 27,000 acres) was owned by the Rock Creek Ranch Corporation, and MFWP had identified it as a problem area because of the refuge it provided for substantial numbers of elk on ground where public hunting was highly restricted [*Montana Elk Management Plan* (2004), Deerlodge EMU]. In September 2010, the State was able to purchase a large portion of the private holdings and establish the Wildlife Management Area. The area is open to public hunting—but with limitations (the main restraint being that most of the area is closed to motor vehicles) [see summary in the Helena *Independent Record,* Oct. 21, 2010; MFWP website http://fwp.mt.gov/news/article].

Harvest data specific to the Wildlife Management Area for the 2010 or 2011 seasons is not available, but it seems likely that from now on, hunting-generated mortality in this elk herd will be a bit higher than in the past. Still, the fact that the Wildlife Management Area is mostly non-motorized allows it to function much like an elk security area on the National Forest.

JERICHO Elk Herd Unit

The Jericho Mountain EHU lies south of U.S. Highway 12, extending westward from Tenmile Creek over the Continental Divide to Telegraph Creek. It includes private land in the valleys along its northern boundary and encompasses a total of 35,345 acres—29,363 acres within HNF administrative boundaries. Aside from the valleylands to the north, most private lands in the EHU are on old mining claims—including part of the town of Rimini. Approximately 33% of the EHU is in private ownership. Much of the northern half of the herd unit is occupied by the 9,440-acre Jericho Mountain inventoried Roadless Area, located primarily on the east side of the Divide in the Tenmile Creek watershed, but lapping westward into the Telegraph Creek drainage in the vicinity of Mike Renig Gulch in the north and Jericho Mountain in the south. This largely unroaded habitat block provides most of the fall elk security in the Jericho EHU.

Some of the montane grasslands in the northern end of the unit above Lazyman and Mike Renig Gulches provide winter habitat for elk in most years. These areas are identified as such on both the MFWP seasonal range map and the HNF "Oil and Gas" winter range map. The rest of the unit is transitional and summer range, with viable summer habitat concentrated in the southern half toward the headwaters of Tenmile and Telegraph Creeks and their tributaries. Most of the herd unit is covered with mature forest (much of it deteriorating from mountain pine beetle infestation). Upland grasslands occur in the northern end of the unit and at a few locations along the Divide, (Bullion Parks, for example). Wet meadows also break the forest continuum in some areas: those in Flume Gulch, Sure Thing Swamps, and Sally Ann Creek are particularly productive as summer wildlife habitat.

Extensive clearcutting (mostly in the 1970s and 1980s) in the greater Hahn Creek and upper Telegraph Creek drainages west of the Divide also serves to disrupt the contiguity of the mature forest. Most cutting units are now dominated by regenerating conifer saplings (almost all lodgepole pine and Douglas-fir), many of which provide hiding cover for big game animals and habitat for snowshoe hares and the lynx that prey upon them. Lynx are resident in this area year-round, as are wolverines. The Tenmile drainage, east of the Divide, serves as part of the drinking water supply for the City of Helena, and as a result, has seen very limited timber harvest on public land over the past several decades. Forest cover is ubiquitous, but as with other areas in the Divide landscape that are dominated by pine forests (mostly lodgepole pine in this case), mountain pine beetle infestation is taking out a majority of the overstory trees.

Historic logging (dating from the late 19th and early 20th centuries) and mining have generated far-flung road systems, some still open to vehicle use, others closed. Habitat effectiveness in summer is now at 70%, which is quite good (Table 9). GIS modeling estimates that 65% of the EHU provides hiding cover—a percentage that is beginning to decline as pine beetle mortality escalates. Just under 30% of HNF hunting season elk range is currently in security areas—much of it associated with the Jericho Mountain Roadless Area. Because the herd unit is relatively close to the city of Helena and other local population centers, fall hunting pressure is fairly high.

BLACK MOUNTAIN – BROOKLYN BRIDGE Elk Herd Unit

Less than half of the Black Mountain-Brooklyn Bridge EHU lies within the Divide travel planning area: The rest is included in the Clancy-Unionville Travel Plan Area to the east. The EHU as a whole covers about 56,340 acres. Roughly 40% of the EHU is in private ownership—the bulk of it along Forest boundaries in the Tenmile and Little Prickly Pear valleys to the north and east. There are, however, considerable private inholdings in the major gulches running northward into Helena and in the greater Buffalo Creek drainage further south.

This herd unit supports a variety of summer, winter, and transitional ranges. About 85% of the unit is mapped as potential winter range (by both MFWP and the HNF)—more than any other EHU in the Divide landscape—but most elk winter use is confined to the northern half of the unit toward Helena and the Tenmile Valley (and outside the Divide travel planning area). The rest of the unit to the south sees most of its elk use from May through November. Most of the northwest half of the EHU lies within the Lazyman–Black Mountain inventoried Roadless Area, which provides excellent habitat for elk in spring, summer, and fall. By contrast, the eastern half of the unit sits adjacent to the City of Helena and to burgeoning rural settlement in the lower Tenmile and Prickly Pear valleys. As a consequence, the road and trail systems in this area are the most heavily used of any in the National Forest. The eastern and western halves of the unit thus stand in stark contrast to one another in terms of human activity levels.

Given the influence of the roadless area, summer range habitat effectiveness in the Black Mountain–Brooklyn Bridge EHU is the highest in the Divide landscape at 87% (Table 3.49). This has been augmented in the east half of the unit by new road/motor trail closures under the Clancy-Unionville Travel Management Plan (HNF 2003). The area centered on Black Hall Meadows in the Roadless Area is particularly important as summer habitat. Likewise, the proportion of fall range in effective ("adjusted") elk security areas is very good at 39.2% (Tables 3.47 and 3.49). This is an important, as the area's proximity to Helena consistently translates to high hunting pressure each fall. GIS modeling estimates that 52% of the EHU provides hiding cover, although cover levels are declining as beetle-killed pine trees continue to come down.

QUARTZ Elk Herd Unit

The Quartz Creek EHU lies mostly within the Clancy-Unionville Travel Plan Area, but its western extremities around Red Mountain fall into the Divide travel planning area. The unit encompasses the headwaters of several drainages flowing eastward into Prickly Pear Creek: Corral Gulch, Lump Gulch, the North and South Forks of Quartz Creek, Clancy Creek, Kady Gulch, Wood Chute Creek, and Spring Gulch. The diminutive western segment of the unit in the Divide travel planning area takes in the westward slope down to Tenmile and Banner Creeks, including the country around Chessman Reservoir and Red Mountain. The EHU includes considerable private and BLM land in the Prickly Pear valley to the east: Slightly over 50% of the herd unit is in non-Forest ownership. The unit covers 36,735 acres with 23,036 acres inside HNF boundaries. As such,this EHU is one of the two smallest herd units in the Divide landscape.

Most of the Quartz Creek EHU serves as transitional and summer range for elk. Typically, the drainage-head basins in the western half of the unit provide the basic summering areas. Some of this habitat has

been disrupted by timber harvest and roading and, more importantly, by old mining operations that have polluted wet meadows and other key summer habitats. These contaminated sites are gradually being reclaimed, one by one, with mine wastes hauled to off-site repositories and the local habitats returning to a semblance of normalcy. Recent closures of a number of roads and motor trails under the Clancy-Unionville Travel Management Plan have improved habitat effectiveness and fall security in this area as well. Current summer habitat effectiveness is 75%—well above the recommended level of 50%. The main contribution of the Clancy-Unionville restrictions has been the elimination of motor routes into a number of key wet sites important to elk and other wildlife species.

Clancy-Unionville Travel restrictions have also improved the effectiveness of fall elk security, which was previously sub-par but now stands at 30.6% within HNF boundaries. While this percentage is good, security is somewhat fragmented among 4 mid-sized areas (Red Mtn-Lava Mtn, Little Corral-Lump Gulch, Kady Gulch, and Spring Gulch), and moverment between security areas can be precarious during the hunting season. Some elk move to the foothills and valleylands east of the EHU in the fall, taking refuge on private lands where public hunting is barred or limited. Public lands in the EHU are readily accessible to nearby population centers in the Helena and Prickly Pear Valleys, and hunting pressure is substantial.

GIS modeling estimates that 45% of the EHU currently provides hiding cover, although pine beetle-generated mortality will reduce cover dramatically in the next 10-15 years.

MFWP has mapped over 80% of the herd unit as potential winter range. The HNF "Oil and Gas" seasonal range maps, on the other hand, show only the northeastern 20% of HNF land within the unit as winter range—which, as it turns out, is where more than 95% of the on-Forest winter elk use in this herd unit has been observed over the last 25 years. This is the area between Corral Gulch in the north and Quartz Creek in the south. The majority of the winter elk use occurs in the foothills and valleylands east of the HNF boundary.

Summary of EHU Habitat Parameters

Table 3.49 summarizes the current status of several key parameters used to assess elk habitat in Elk Herd Units. Three parameters—percent hiding cover on summer range, percent thermal cover on winter range, and percent of fall range in security areas—are Helena Forest Plan big game standards. The remaining parameters—hunting season open route density and percent habitat effectiveness on summer range—are not Forest Plan standards, but they are recognized as useful indictors of elk habitat status. The measurements in Table 3.49 are for entire Elk Herd Units—not just the portions of the units that fall within the Divide travel planning area.

Currently, two herd units do not meet the 30% objective for fall security. All five of the EHUs that contain some winter range are out of compliance with the *HFP* thermal cover standard (≥25% cover on winter range). Only one herd unit fails to comply with the summer range hiding cover standard (≥50% cover on summer range), but within the next 10-15 years as large numbers of lodgepole, ponderosa, and whitebark pine trees killed in the bark beetle outbreak begin to fall, all 6 herd units will eventually fail to comply with this standard. Although many standing trees are now dead, they continue to provide the same degree of hiding cover as when they were alive. Eventually, new cover will be provided by regenerating pine saplings. But for now, the situation is in flux.

Table 3.49 Status of Elk Herd Units in the Divide Landscape with regard to key measures of elk habitat [cover % include losses from the roadside Hazard Tree Removal Project (2010-2011)]

EHU	Smr Range % Hiding Cover	Wtr Range % Thermal Cover	% of Fall Range in Elk Security Areas	Fall Open Route Density	Smr Range % Habitat Effectiveness
Little Prickly Pear – Ophir	46 %	7 %	24 %	1.6 mi/mi²	65 %
Greenhorn	56 % *	4 %	16 %	1.8 mi/mi²	74 %
Spotted Dog – Little Blackfoot	59 %	no wtr range	45 %	1.2 mi/mi²	72 %
Jericho	65 %	13 %	30 %	1.2 mi/mi²	70 %
Black Mtn – Brooklyn Bridge	52 %	14 %	39 %	1.9 mi/mi²	87 %
Quartz	56 %	7 %	31 %	1.1 mi/mi²	75 %

* Greenhorn is the only EHU in which summer range occupies only part of of the unit—and as a result,hiding cover percentages are different for summer and fall ranges [see Table 6, p. 43].

Elk Population per Montana Elk Management Plan

Elk Management Units

The Divide travel planning area falls within two of the Elk Management Units (EMUs) described in the *Montana Elk Management Plan* (2004). The northern half of the planning area lies within the Granite Butte EMU and the southern half within the Deerlodge EMU. Both EMUs straddle the Continental Divide. The Granite Butte EMU takes in Hunting Districts 293 and 343 north of U.S. Highway 12 (in addition to others further north). The Deerlodge EMU takes in Hunting Districts 215 and 335 south of Highway 12 (in addition to others southward toward Butte).

The overall population objective for the Granite Butte EMU is 2,100 elk. In 2004 when the *Elk Management Plan* was released, MFWP estimated the population to be slightly below the objective (based on aerial winter range surveys). Today, aerial surveys indicate that it is somewhat above the objective. Bull/cow ratios in the southern part of the EMU that take in the Divide travel planning area are close to the objective of 10 bulls/100 cows (somewhat below the objective in HD 293, somewhat above it in HD 343).

The population objective for the Deerlodge EMU is 2,100 elk. In 2004, MFWP estimated that numbers were a bit below this level (at around 1,875 elk). The numbers have risen in the last 7 years. Elk populations are now near or above objectives in the northern half of the EMU (which includes the Divide travel planning area), but they are still below objectives in the southern portion of the EMU toward Butte. As well, bull/cow ratios in the northern half of the EMU have been holding at around 12-13 bulls/100 cows in recent years—above the 10 bulls/100 cows objective.

Coordinating HNF and MFWP Elk Management

Helena Forest Plan standards and guidelines for big game are designed to maintain habitat conditions on the National Forest that help MFWP meet its goals for local elk populations. MFWP's primary tool in managing elk is the manipulation of hunting regulations (setting harvest quotas for different sex/age

classes, defining hunting areas, setting seasons, arranging for block management on private lands, and so on). The Forest Service is able to influence the equation by managing vegetation (cover and forage) and controlling hunter vehicle access on different parts of the Forest. In spite of this reasonably well-defined division of responsibility, there remain some knotty problems in coordinating management between agencies.

For one, the quality of aerial survey data on which MFWP bases much of its annual population estimates can vary widely from year to year and from one hunting district to another. This is a function of weather conditions, snow cover, variable elk movement patterns, and inherent viewing difficulty imposed by local topography, forest vegetation, and artificial obstructions (powerlines, fences). The survey data (along with harvest statistics) are key to determining what adjustments MFWP needs to make to its hunting regulations each year. Trends in this data over time also suggest what the HNF needs to consider in terms of cover distribution and vehicle restrictions on its road and trail system. Changes to these components, particularly forest cover, are difficult, if not imposible to make on a year-to-year basis in an attempt to follow abrupt yearly shifts in MFWP survey results.

Another problem has to do with the disconnect between the scale of analysis units. MFWP sets its elk population objectives for *elk management units* (EMUs) and *hunting districts* (HDs). In this area, EMUs are roughly 700,000 acres in size (Deerlodge EMU ≈ 695,000 acres; Granite Butte EMU ≈ 712,600 acres). Both EMUs cover 3 standard hunting districts, which vary considerably in size, but average about 235,000 acres. MFWP centers its annual population estimates and consequent tweaking of hunting regulations on hunting districts.

The HNF, on the other hand, focuses its habitat management on *elk herd units* (EHUs), which in the Divide landscape may be as small as 35,000 acres, but average a bit less than 60,000 acres (Table 3.48). The problem, then, is one of determining how conditions in a given elk herd unit contribute to the population status of elk on a hunting district 3-8 times its size and to the population objectives for an elk management unit 8-20 times its size, given the multifarious conditions in other herd units and private land operations that feed into the scenario.

In many cases, it is possible to scrutinize the MFWP flight data and divide hunting districts into distinct segments in terms of how local elk populations fare in each area. In HD 293, for example, elk herds in the northern half of the district are beset by high rates of natural predation and consequent shifts in population structure that are not characteristic of elk groups in the southern half of the district. Wherever possible to partition hunting districts into smaller sub-areas based on elk population properties, it has been done—in order to provide a better match between MFWP and HNF management units and to potentially tease out some correlations between population dynamics and habitat status of elk herd units.

Hunting Districts

This section summarizes the status of the four hunting districts in the Granite Butte and Deerlodge EMUs that cover the Divide travel planning area.

Hunting District 293

Hunting District 293 lies west of the Continental Divide and north of U.S. Highway 12. It includes the southwestern half of the Little Prickly Pear–Ophir Elk Herd Unit (EHU) and the southwestern edge of the Greenhorn EHU (the portions of those two units on the west side of the Divide). These HNF herd units account for a little over 15% of the hunting district, which extends westward across private land to the center of the Avon Valley and northward across the Lincoln Ranger District to State Highway 200 in the Big Blackfoot River valley.

In the early 1990s, aerial surveys often revealed more than 1,000 elk on HD 293 winter ranges. MFWP responded in 1994 by increasing antlerless elk hunting permits from 250 to 450. The antlerless elk harvest

spiked dramatically in that year (to about 500) but then began falling: It averaged 121 antlerless elk between 2000 and 2009 (see *Elk Survey and Harvest Data for Blackfoot Hunting Districts, 1986-2010)*. After 1996, there was a dramatic drop-off in the annual winter range population count (from 1,087 elk in 1996 to 387 elk in 1997). And since then, trends in the elk population have been somewhat difficult to decipher, primarily because aerial surveys have been erratic—sometimes done in spring, often when visibility was limited by weather or ground conditions, sometimes on only part of the district, and sometimes not at all [see *MFWP Elk Surveys, HD 293,* 1998-2010; *Elk Survey and Harvest Data for Blackfoot Hunting Districts, 1986-2010*]. The average count for HD 293 from 1997 through 2010 (on years when the entire district was surveyed) is 542 elk. The count for 2011 was about 600 elk.

The population objective for HD 293 in the 2004 Elk Management Plan is 750 elk, but the northwest segment of the district was transferred to HD 298 (a new district) in 2008, so that now there is a bit of a disconnect between the original population objective and what is possible under the new configuration. Average ratios of 13 bulls/100 cows from 1997 through 2009 were above hunting district objectives of 10/100. During the same period, calf/cow ratios were typical of hunting districts in this area, averaging 38 calves/100 cows.

In the last 5 years, the number of elk counted during aerial surveys for the hunting district as a whole (590-710 elk) has remained in the same general range as in previous years (back to 1997). But, in the northern half of Hunting District 293 (the Blackfoot River Valley) the number of animals observed by MFWP biologists on the ground and by local hunters and landowners has declined noticeably. Likewise, while calf/cow ratios during this same period have remained relatively stable for the district as a whole (averaging 31 calves/100 cows), calf survival in the Blackfoot Valley has plummeted. Much of the decline has been attributed to rising predation from mountain lions, wolves, black bears, and grizzly bears, whose populations have all burgeoned at the same time, due to a variety of circumstances (J. Kolbe, quoted in the *Helena Independent Record,* Feb. 26, 2012). Other factors—including several years of drought, changes in vegetation patterns from large fires, and hunting quotas over the last decade—may be contributing to the observed shifts in elk (and deer) population size and structure. But predation appears to be the primary limiting factor in the northern half of HD 293.

Meanwhile, in the southern half of the district (the Avon Valley south of the Ogden Mtn – Dalton Mtn ridge), predation has not been an obvious problem for big game populations. Population estimates for this part of the district were in the range of 300-450 elk from 1998 through 2003. Some recent counts (2004, 2005) have been in the 180-190 range. These numbers may reflect temporary population decline due to over-harvest or the fact that surveys were conducted after many elk had already migrated off winter ranges (late April). More likely, they reflect a seasonal shift in elk distribution (see *HD 293 Elk Surveys, 2004, 2005)*. Biologists have noted that in some years, elk from HD 293 have moved eastward into HD 343 to escape late-season hunting pressure (extending into January) and occasionally to move to less severe snow conditions (see comments accompanying *MFWP Elk Surveys, HD 343,* 2007). By 2006, counts for the southern half of HD 293 were once again over 300 elk. In 2010, 311 elk were counted.

In the end, MFWP objectives for elk populations (herd numbers, bull/cow ratios, calf survival) continue to be met in the southern half of the HD 293—the area influenced by the HNF road and trail network in the Divide landscape. Problems in the Blackfoot Valley in the north half of the district appear to be primarily a consequence of abnormally high rates of predation—and *not* a result of habitat dysfunction on that part of the National Forest (the Blackfoot landscape).

Hunting District 215

Hunting District 215 lies west of the Continental Divide and south of U.S. Highway 12. It takes in the Spotted Dog – Little Blackfoot EHU, as well as western portions of the Jericho and Black Mountain–Brooklyn Bridge EHUs. These units occupy only the northeastern quarter of the hunting district, which

extends westward across private and State land to Interstate-15 and southward across the Beaverhead-Deerlodge NF and private land to Interstate-90.

The northern portion of HD 215 (the area that includes the southwestern segment of the Divide travel planning area) is a key region for elk, and the population has remained relatively high here for several years. Prior to 2007, MFWP had been counting roughly 800-950 elk on HD 215 winter ranges in most years. This number jumped to 1,365 animals in 2008 and into the 1,717 - 1,955 range for 2009-2011. More than 60% of elk observations have been in the northern half of the district (the portion encompased by the Divide travel planning area). The population objective for the District as a whole is 1,000 animals.

In spite of the relatively high population numbers, observed bull/cow ratios were relatively low through 2008, averaging 6 bulls/100 cows over an 8 year period (the objective being a minimum of 10 bulls/100 cows). By 2010, the observed ratio was 18 bulls/100 cows. No estimate was made in 2011 because of poor viewing conditions (although it was noted that the number of spike bulls was particularly high). Variation in the bull/cow ratio is almost certainly an artifact of variable viewing conditons and of the known tendency of bull elk to frequent habitats where they are difficult to view (typically, mature forest). Cows and calves, on the other hand tend to be found most often in open grassland and shrubland habitats where they can be tallied more easily. Be that as it may, results of the 2010-2011 surveys demonstrate that, while precise numbers are difficult to come by with any consistency, the bull/cow ratio is certainly well above the population objective of 10 bulls/100 cows (though spikes and raghorns dominate the count).

The problem for the northern part of HD 215 in recent years has not been one of inadequate fall security. Abundant security habitat in the Spotted Dog–Little Blackfoot elk herd unit on the HNF and in the big block of ranchland just west of the Forest (which has been off-limits to public hunting) has allowed large numbers of elk to survive the hunting season. MFWP has felt that the refuge provided by the private ranchland has supressed hunting opportunity. Elk begin moving to this winter range area as early as the start of the bow season in September. The movement may be a direct response to pressure from bow hunters and motorized recreation on the Forest, but it may also reflect an established pattern of migration down to secure and benign valleyland habitat regardless of immediate circumstances.

Now that the State of Montana has purchased most of these private lands (August 2010) and converted them to a public hunting area (the Spotted Dog Wildlife Management Area), hunters should have more of an effect on this large elk population—although the effect will be tempered by the fact that only walk-in hunting is available. The impact of the 2010 hunting season—the first in the Wildlife Management Area—appears to have been minimal, with the population count for HD 215 increasing still further from 1,715 to 1,955 elk between 2010 and 2011.

In spite of a number of wolf packs having centered their activity along the western edge of the HNF and in the adjacent ranchlands since 1995, calf/cow ratios have not been depressed: Ratios have been 30-40 calves/100 cows, which is typical of most hunting districts in this area.

Hunting District 343

Hunting District 343 lies east of the Continental Divide and north of U.S.Highway 12. It takes in most of the Greenhorn EHU and the northeastern half of the Little Prickly Pear–Ophir EHU (which is outside the Divide travel planning area). These EHUs account for roughly ⅓ of the hunting district. The rest of the district extends eastward off the Forest into the Helena and Little Prickly Pear Valleys and northward to Flescher Pass on the Lincoln Ranger District.

Counts of the elk population in this district were relatively stable between 2000 and 2008, ranging from around 655 to 975 animals; but then they dropped into the 445-580 range in 2009 and 2010. Given the absence of a commensurate increase in hunter success or natural mortality (although mortality due to wolf kills has increased somewhat over the last decade), or a drop in calf production and survival, MFWP

suspects that the lower winter counts reflected the switch to a less effective survey method and movement of elk off winter range prior to survey flights rather than a large population decline. The 2011 count was back up to 713 elk. This is well within the population objective for HD 343, which is 700 elk (±20% = 560–840 elk) [see *2011 Post-season Survey of Elk in HD 343*].

Bull/cow ratios have averaged 13 bulls/100 cows since 1998, which is considered a "moderate" ratio and is in excess of the hunting district objective of 10 bulls/100 cows. Likewise, calf/cow ratios have averaged 30 calves/100 cows since 1998—although the 2011 count was 49 calves/100 cows. This is typical of calf survival rates throughout the Divide travel planning area and suggests that natural predation has not been unduly suppressing calf survival in these populations.

In recent years, HD 343 has sometimes picked up elk from HD 293 to the west later in the year because of extended hunting seasons in that district. Many elk in HD 343 seek refuge during the hunting season on large blocks of private land where landowners do not allow public hunting. Of the large landowners in the district, five allow hunting, five do not. With private lands accounting for 52% of the district, this has a real impact on hunting success, which has been relatively low (about 40% on antlerless permits) in recent years. Statewide success averages about 50%.

Hunting District 335

Hunting District 335 lies east of the Continental Divide and south of U.S. Highway 12. It encompasses the Quartz EHU, the eastern half of the Jericho EHU, and most of the Black Mountain–Brooklyn Bridge EHU. These HNF herd units make up the western 60% of the hunting district, the eastern reaches of which occupy BLM and private land in the adjacent foothills and Prickly Pear Valley south of Helena.

MFWP winter range surveys showed the elk population increasing in the decade 1999-2008: Population counts that averaged 510 elk earlier in the decade had risen into the 655-775 range by 2006-2008. MFWP biologists felt that this was a function of mild winters, increased travel restrictions in the Clancy-Unionville area of the HNF, and fewer hunting permits for antlerless elk (*MFWP HD 335 Elk Survey 2005,* 2007). In 2009 the number of elk counted dropped to 450, and then to 388 in 2010. As in some other local districts, MFWP believes that the lower counts were a function of a less effective survey method and of elk having moved off winter range by the time surveys were conducted (see *Post-season Survey of Elk in HD 335* for 2010 and 2011). There was no evidence of a sudden increase in hunter success, elevated natural mortality, or decreased calf production/survival that might initiate a downward trend in local elk numbers. In 2011, the elk count was back up to where it had been prior to 2009: 670 elk were tallied, which is well within the population objective for HD 335 (600 elk ±20%).

Bull/cow ratios have been fairly consistent over the last decade, averaging 13 bulls/100 cows. The 2011 count was the highest in the last 25 years at 19 bulls/100 cows. The objective for the hunting district is a minimum of 10 bulls/100 cows. Brow-tined bulls, however, have accounted for only about 2% of the count during this period (almost certainly an underestimate, but lower than biologists would like to see). Calf/cow ratios have been more variable over the last 10 years, ranging from 15 calves/100 cows (2008) to 45 calves/100 cows (2011). The 10-year average is 31 calves/100 cows—which is typical of hunting districts in the Deerlodge and Granite Butte EMUs and indicates a level of calf production and survival sufficient to maintain current elk populations under a normal regime of hunting and natural predation.

MFWP feels that elk in HD 335 are being impacted by livestock grazing , partly on the HNF, but more so on privately-owned winter ranges. Because natural forage is limited, elk turn to agricultural fields and haystacks stockpiled for winter livestock feed. This, in turn, has led to ranchers requesting special hunts to trim elk numbers. MFWP believes that the big Montana Tunnels mine east of the Forest on Clancy Creek has reduced winter range opportunity for elk (and more so for mule deer) in the area southwest of Jefferson City east of the Forest bounday.

Mule Deer

Of the two deer species that inhabit the Helena NF, the mule deer (*Odocoileus hemionus*) is the more common. In spring, summer, and fall, mule deer are most often found in montane habitats from the foothills on up into the high alpine zone, whereas white-tailed deer (*Odocoileus virginianus*) focus much of their activity on riparian bottomlands, lowland forest, and agricultural lands in the valleys—most of it off the Forest (Foresman 2012, p. 384-393). In winter, both species occupy winter ranges in the lower foothills and valleys, sometimes living in close proximity to one another when deep snow forces them into the same areas.

Like elk, the mule deer serves as management indicator species for hunted wildlife on the HNF. Most big game standards and guidelines in the *HFP*, however, are directed specifically at elk—the assumption being that management addressing the needs of elk will automatically take care of mule deer (and other big game species). This is true to a degree, but deer are different enough from elk that resource management—vegetation manipulation, in particular—needs to account for certain local habitat configurations that are important specifically to deer. Shifts in the road and trail system proposed in the *Divide travel plan*, however, would not generate problems specific to mule deer that are different from those that impact elk—and for this reason, mule deer analysis is not carried forward as a separate section in the *"Environmental Consequences"* portion of this report.

As with elk, a majority of mule deer in the Divide landscape over-winter on private and State land in the foothills and valleys. Unlike elk, however, not all deer move *en masse* to high elevation summer ranges. Some may remain in the valleys all year: The deer population in the City of Helena, for example, is a year-round resident population, distinct from adjacent migratory groups. Other deer that winter in the valley move only a short distance up onto neighboring HNF land where they remain through the fall. This is an example of what Pac *et al.* (1991, p. 97) call "adjacent" seasonal ranges. Many more continue on to more distant summer ranges at higher elevation—an example of "distinct" seasonal ranges (Pac *et al.* 1991, p. 97). These migrating deer tend to follow the spring green-up as it spreads from the valleys up through the foothills and into the montane summer ranges in June.

Mule and white-tailed deer are in the rut for much of the hunting season in October and November, and bucks are often on the move within their fall ranges. But because deer are less inclined than elk to move off local ranges to security areas several miles away (Mackie *et al.* 1998), they often rely on local hiding cover to avoid hunters. Thus, local blocks of hiding cover outside unroaded security areas (in patches considerably less than the 40 acres recommended for elk) are more important to deer than to elk.

As a rule, the quality of summer range (not winter range) is the primary factor regulating deer numbers (Mackie *et al.* 1998, p. 131; Pac *et al.* 1991, p. 279). In mountain and foothills environments, summer habitat should provide high forage quality (of leafy forbs) and security for fawn rearing. Management needs to emphasize habitat diversity (Mackie *et al.* 1998, p. 136). Mature and over-mature conifer stands with multiple layers, numerous openings, abundant edge, and inclusions of other diverse micro-communities are ideal (Mackie *et al.* 1998, p. 49, 55; Pac *et al.* 1991, p. 279). A balance of high-quality forage, summer thermal cover, and screening/hiding cover are important for raising fawns and building energy reserves for winter survival and future fawn production.

While summer nutrition may be the key factor that provides deer the wherewithal to survive the winter, effective winter habitat is also important, allowing animals to hold onto as much of their accumulated body weight as possible. Pac and others (1991, p. 276) emphasize the need to manage mule deer winter ranges as *maintenance habitat* where animals can conserve energy. Their studies in the Bridger Range of southwest Montana suggest that forage characteristics are often of secondary importance to local topography and to the abundance of conifer stands that can ameliorate snow depth and temperature. The conclusion that thermal cover (≥70% canopy closure) is seldom a key habitat component for elk on

winter range [see previous discussion of elk winter range], does not necessarily apply to deer. Research indicates that mule and white-tailed deer are more dependent on thermal characteristics of forest cover than are elk. At least on some winter ranges, deer appear to require dense stands of mature timber with canopy closure in excess of 60% to withstand prolonged bouts of severe winter weather. While typically deficient in forage, these stands can provide a favorable thermal environment and minimize snow depth (Mackie *et al.* 1998, p. 52, 136; Pac *et al.* 1991, p. 77, 276, 279).

Deer, in general, are more likely than elk to become habituated to open roads and associated human activity (as common observation across the HNF and adjacent lands will attest). But, most deer do in fact avoid roads as much as possible (Rost and Bailey 1979). As a result, regular vehicle traffic will lower habitat effectiveness, thus reducing the amount of habitat that deer find suitable for foraging, resting, raising young, and escaping from perceived danger. It is important that Forest road systems do not occupy so much key summer habitat that numbers of deer do not have suitable access to the high quality habitat components they need to maintain productivity and surviorship. The impact of roads on deer summer habitat in general can be estimated via the "habitat effectiveness" indices calculated for elk summer range

Deer in numerous local sub-populations have adapted to living in close proximity to humans, especially in winter (as in numerous local subdivisions and in the City of Helena). But, those that winter on more sparsely settled agricultural lands and in the foothills are more likely to try to avoid human disturbance throughout the winter. Some researchers have noted that in order to minimize all responses by mule deer to snowmobiles or hikers, they would have to be more than 350 meters away (Freddy *et al.* 1986). Perry and Overly (1976) recommended a distance of one half mile away to prevent disturbance and displacement of mule deer. They found that mule deer were interrupted more often, and longer, by persons afoot than by snowmobiles.

Local Mule Deer Population Management

Mule deer numbers have cycled up and down over past decades, hitting low points in the 1970s and 1990s. MFWP does not survey deer as rigorously as elk in the Divide landscape—picking them up incidentally during elk winter range flights—and as a result, population estimates are often murky. However, the aerial surveys of elk/deer winter range, check station data, hunter surveys, and field observations by biologists provide enough information on population trends to allow the Fish and Game Commission to make yearly adjustments in the allowable mule deer harvest.

As discussed earlier, four hunting districts overlap the Divide landscape: HDs 215 and 293 west of the Divide and HDs 335 and 343 east of the Divide. In all of these districts, *antlered* deer harvest is managed via the general deer license or by B license permits: these place no limits on the number of hunters but restrict the take to one deer per hunter. This pattern has remained constant over several decades in spite of population fluctuations. The allowable harvest of *antlerless* deer, however, has varied over time and between districts, and has been the primary mechanism for making adjustments in response to field data. During the population ebb of the 1990s, no antlerless harvest was permitted, thus protecting the reproductive segment of the population. In 2001, with local populations increasing east of the Divide, a total of 50 B-licenses for antlerless deer became available in HDs 335 and 343. The number of antlerless B-licenses in these districts peaked at 500 in 2008 and has since dropped to 300 licenses as deer numbers again look to be falling off. In the 2 hunting districts west of the Divide, no antlerless deer B-licenses were issued until 2008 when 50 licenses were permitted in HD 215. This number dropped to 25 in 2012. In HD 293, no B-licenses for antlerless deer have been issued in the last 2 decades.

All this may be about to change, however, as numbers of mule deer (and white-tailed deer) are once again dropping precipitously (by 60-90%) across much of Montana. Reasons for the current population decline are multiple: they include the aforementioned cyclical trends in deer populations, increase in disease (primarily a problem in white-tailed deer), harsh winter conditions in 2011-2012, and a rise in predator

populations. Shifts in habitat quality and road patterns have not been implicated in the decline. In response, the Fish and Game Commission (as of early 2014) is considering eliminating most B-licenses for both antlered and antlerless deer statewide—including the 4 Divide landscape hunting districts. This would prevent hunters from harvesting more than one deer and would protect reproductive females [see *Helena Independent Record:* 2013 Dec. 13, 2014 Jan. 5; MFWP website: http://fwp.mt.gov/hunting/publicComments/2014_15HuntingSeasonSetting.html].

Moose

The Shiras moose (*Alces alces shirasi*)—the smallest of the 4 North American moose subspecies—is widely, but erratically distributed across the Rocky Mountains of southern Canada and the northern U.S. During the 20th century, Shiras moose dispersed southward into areas where they had not been observed by explorers and settlers in the 1800s, ranging as far south as northern Utah and Colorado by the 1990s (Kay 1997). Recently, however, moose populations have been declining in several parts of the west (as well as in other parts of the country—most notably Minnesota). In Montana, populations appear to be dwindling in some areas (the Big Hole country) but expanding in others (the Centennial Valley; eastern Montana along the Missouri River) (Foresman 2012, p. 374-375). Given the absence of hard data, Montana Fish, Wildlife and Parks has initiated three long-term population studies to decipher trends in the Montana moose population. Current hypotheses as to why some local moose populations are shrinking include climate change-driven increases in parasites, decline in the quality of foraging habitat, and rising predator populations. Hunting pressure on moose has dropped off substantially since 2006 and is not seen as a contributing factor (see *Helena Independent Record,* 2013 Oct. 31).

The Helena Forest Plan addresses the needs of moose by specifying that moose habitat "will be managed to provide adequate browse species diversity and quantity to support current moose populations" (HFP, p. II/19). Moose are also covered, to an extent, by Forest Plan management guidelines for elk that limit road density, maintain certain levels of forest cover, and protect key habitat components—particularly riparian areas and other productive wet habitats. As with mule deer, because moose are unlikely to be affected by changes in the road and trail system proposed in the *Divide travel plan* differently than elk, they will not be analyzed separately in the *"Environmental Consequences"* section of this report.

Moose are solitary for most of the year, aside from cows-with-calves and loose winter groupings, and their numbers in and around the HNF are inherently low compared to those of elk and deer (MFWP observation records; personal observation). The Divide landscape provides numerous patches of suitable moose habitat. Key habitat is naturally fragmented because of its association with riparian areas, drainage-head basins, productive north- and east-slope forest, and other habitat features with disjunct distribution across the landscape (Costain 1989, p. 138-143; Costain and Matchett 1992, p. 27-31).

From mid-spring through mid-fall, moose move between productive local foraging sites every few days—sometimes traveling several miles (Matchett 1985, p. 123, 130). Although they often travel at night, moose are sometimes seen on the move during the day in habitats that seem to offer them little in the way of food or cover. The travel routes moose choose in moving around appear to have no consistent habitat characteristics, and they may use open roads for this purpose. While moose may spend part of the winter in stands of mature timber at mid elevation, most winter range is concentrated in lower elevation riparian areas where browse is plentiful and snow depths are more moderate (Costain 1989, p. 89-90, 34-36).

The number of annual moose licenses issued to hunters in the three moose hunting districts that cover the Divide landscape is small. From 1995 through 2007, the combined total for the 3 districts (which extend from Butte in the south to the Scapegoat Wilderness in the north) was 10-12 licenses per year. Since then, the total has dropped to 7 licenses per year—all for antlered bulls. Nonetheless, because many moose choose to feed and rest in key habitat sites near roads, putting up with nearby human

activity, they are susceptible to poaching or accidental shooting, and human induced mortality inevitably exceeds the hunting quotas set by MFWP (Matchett 1985, p. 132; G. Joslin, comments in MFWP 2007 Elk Survey, HD 335; personal observation). The higher the open road density in areas with productive moose foraging habitat, the greater the risk to moose.

Threatened and Endangered Species

Grizzly Bear

Biological Factors

Population Parameters and Habitat Relationships

The grizzly bear (*Ursus arctos horribilis*) is the largest carnivore in North America. Five areas in the lower 48 states currently support grizzly bear populations. These areas represent less than 2% of the grizzly's former range (USDI 1993). Of the five areas, two of them straddle the Continental Divide in Montana: The Greater Yellowstone Ecosystem (GYE) and the Northern Continental Divide Ecosystem (NCDE). The Divide travel planning area is located partway between these large wildland ecosystems and thus is in a position to intercept any exchange between the two.

Adult grizzly bears are individualistic and normally solitary wanderers. Females with cubs and bears defending food are common causes of confrontation with humans (USDI 1993). The home ranges of adult male grizzlies are generally two to four times larger than adult females. Home ranges of adult bears overlap, and they may vary in size and location in relation to food availability, weather conditions, and interactions with other bears (USDI 1993).

Grizzly bears are long-lived—with many individuals surviving more than 20 years in the wild. But, they have one of the lowest reproductive rates among terrestrial mammals, which precludes rapid population increase. During a female's lifetime, if she has litters of two cubs with a 50:50 sex ratio and a 50% survivorship of young to age 5.5 years, at best, she can replace herself with one breeding age female in the first decade of her life (USDI 1993). Age of first reproduction and litter size varies and may be related to nutritional state. In areas where suitable habitat options are meager, the ability of local populations to multiply are limited.

Grizzly bears are opportunistic feeders and will prey on or scavenge almost any available food. Plants with high crude protein content are important food items as are other animals, ranging from insect larvae to elk. The search for food has a prime influence on grizzly bear movements. Upon emergence from the den a grizzly will move to lower elevations, concentrating on drainage bottoms, ungulate winter ranges, and other sites where food requirements can be met. Throughout spring and early summer grizzlies follow plant phenology back to higher elevation. In late summer and fall, there is a transition to fruit and nut sources, as well as herbaceous materials. Bears will deviate from this general pattern, adapt to local conditions, and go wherever they need to in order to meet their food requirements (USDI 1993).

Conifer forests are important to grizzlies. In some studies, up to 90% of radio relocations have been in forest cover too dense to observe the bears. Bears use dense forests for thermal cover, hiding cover, and day beds. The importance of open grassy parks with nearby forest cover has also been documented (USDI 1993). Other key habitat components are productive foraging sites such as avalanche chutes, wet meadows, riparian sites, and whitebark pine stands.

Grizzly bears usually excavate dens prior to entry in November but sometimes as early as September. Dens are usually situated well away from human activity on steep slopes where wind and topography cause deep snow to accumulate and where snow is unlikely to melt during warm periods (USDI 1993). While bears seldom emerge from dens in winter, intensive nearby human activity such as snowmobile

riding may disrupt hibernation and lead to a detrimental drain of limited energy reserves (see Claar *et al.* 1999, p. 7.25).

Influence of Roads and Human Presence

Optimal grizzly bear habitat across the northern Rockies is best defined by the availability of large tracts of relatively undisturbed land that provides some level of security from negative encounters with human enterprises (USDI 1993). To that end, "effective" habitat is often described in terms of core areas – areas free of motorized access during the non-denning period (IGBC 1994) – for each season of use. Open road and total road densities, as well as the distribution pattern of roads, are important measurements in determining core areas and understanding the extent of habitat security for grizzly bears.

Many studies have found that most grizzly bears avoid areas with open roads if they have the choice (Mace and Waller 1996; McLellan and Shackleton 1989). Mace and Manley (1993) determined that adult grizzlies used habitat with *open* road densities exceeding 1.0 mi/mi^2 less than expected. All sex and age classes used habitat with *total* road densities above 2.0 mi/mi^2 less than expected. Grizzly bears generally adjust to disturbance associated with roads by avoiding the areas around regularly-traveled routes—which diminishes the amount of habitat available to the bears. New roads often provide escalating human access into previously remote areas. That, in turn, may encourage human settlement, recreation, and other land uses. These activities can increase the frequency of human-bear confrontations, increase mortality, reduce habitat availability, and ultimately suppress grizzly populations.

Open roads and motor trails that penetrate key grizzly bear habitats may have an impact well beyond that indicated by road density alone. Riparian zones are heavily used by grizzlies for feeding and as travel corridors, and roads located in these areas in occupied grizzly country may result in indirect habitat losses through avoidance behavior by the bears (Mace *et al.* 1996, 1999 *cited in* Schwartz *et al.* 2003, p. 576). In summer, most bears avoid areas of high recreational activity even when it occurs in preferred habitat (Haroldson and Mattson 1985; McLellan and Mace 1985). Bears that do probe into high-use recreational areas run the risk of negative, and sometimes fatal, encounters with humans. Because suitable grizzly foraging sites are localized and fragmented across the landscape, they are often a limiting resource, the progressive diminution of which may greatly lower the potential of a given area to support the bears.

With or without roads, regular human presence in occupied grizzly range increases the likelihood of negative interactions. While many such encounters between grizzlies and backcountry recreationists are a matter of chance, others are created by slipshod sanitation and food storage that can draw bears into camps. Gut-piles and other parts of downed animals left unattended by hunters are an additional attractant that may bring bears and humans into close contact. Trash, bird feeders, gardens, fruit trees, and other outdoor food sources may also attract grizzlies to rural residences that they would normally avoid. In some areas, the presence of free-ranging livestock on both public and private lands provides a relatively easy prey source for grizzlies, leading to ranchers calling for predator control.

Considering the gamut of human activity in grizzly country, the USFWS has identified human access management, sanitation, and livestock grazing as the primary management elements that adversely affect grizzly bears in and around the NCDE. While other land management activities influence grizzlies, these are the three human generated components that produce most of the adverse effects (USDA 2013, p. 2). Of the three elements, "human access management", which encompasses both roaded and unroaded means of access, is directly relevant to Divide travel plan proposals.

Management Considerations

Grizzly Bear Recovery Zones

The grizzly bear has been listed as a threatened species in the lower 48 states since 1975. The governing management document is the *Grizzly Bear Recovery Plan*, initially approved in 1982 and revised in 1993 (USDI 1993). The 1993 version remains in effect today, although as bear distribution and management

needs have shifted, the Plan has been clarified by other documents such as the Interagency Grizzly Bear Committee Guidelines (IGBC 1986) and the Montana Grizzly Bear Management Plan for Western Montana (Dood *et al.* 2006) . The 1993 Recovery Plan identified seven grizzly bear ecosystems (5 currently occupied, 2 unoccupied) around which the primary recovery zones were to be centered. The intent of the Plan has been to generate viable grizzly populations sufficient to remove the bear from the Endangered Species List in each of the 7 ecosystems. So far, this has been tentatively achieved in only one area—the Greater Yellowstone Ecosystem (GYE), where grizzlies were delisted in 2007. Since then, problems involving the decline of whitebark pine—a key grizzly food source—have led to Yellowstone bears being returned to the list (2009).

Based on an abundance of field observation and circumstantial evidence, as well as some DNA identification, all grizzly bears in the Divide landscape are assumed to have originated in the Northern Continental Divide Ecosystem (NCDE) to the north. This recovery zone is centered on Glacier National Park and the Bob Marshall Wilderness complex and extends southward from the Canadian border across the northern quarter of the Lincoln Ranger District on the Helena NF. So far, there has been no evidence of bears moving northward into this area out of the Greater Yellowstone Ecosystem: All movement appears to be southward.

Population Status and the Grizzly Bear Distribution Zone

Analysis by Mace and others (2011), based on 6 years of demographic data from a variety of fieldwork, indicates that by 2009 the NCDE and adjacent areas were supporting a growing population of more than 1,000 grizzly bears. The analysis estimated annual population growth rate at about 3%. Annual monitoring since 2009 (Mace and Roberts 2012, 2013) shows that the rates of reproduction and mortality that have been producing the 3% growth rate are continuing. Current population numbers (≈1,100 grizzlies) are substantially greater than the estimate of 440-680 bears believed to have inhabited the ecosystem in 1975 when the grizzly was listed as a threatened species. Also, work by Kendall and others (2009) has shown that this population is characterized by high genetic diversity and is expanding its distribution beyond the NCDE in all cardinal directions. In sum, research and monitoring over the last decade clearly point to a continuing "positive trajectory in population trend" in the NCDE grizzly bear population (Mace et al. 2011).

This expansion, documented by targeted survey work and many fortuitous observations in the field, led USFWS, USFS, MFWP, and Indian tribal biologists in 2002 to designate the northern half of the Divide landscape on the Helena Ranger District as part of a "Grizzly Bear Distribution Zone"—an area outside the NCDE Recovery Zone that was beginning to be occupied by grizzlies. This area extends southward from the NCDE across the Blackfoot landscape and the northern half of the Divide landscape to the vicinity of Mullan Pass (see USDA 2005b, p. 4, fig.1). The relative proximity of the northern half Divide landscape to established grizzly populations on the Lincoln Ranger District to the north increases the probability of bears being encountered there.

Given the number of credible grizzly reports in the southern portion of the Divide landscape—south of Mullan Pass and U.S. Highway 12—since 2002, the HNF has now extended this Distribution Zone southward to encompass the entire landscape down to the Helena/Beaverhead-Deerlodge NF boundary (USDA 2013). The creation of this "Expanded Distribution Zone" recognizes the fact that grizzly bears are now present throughout the entire Divide landscape—although in very low numbers (USDA 2013).

Interagency Grizzly Bear Committee Guidelines

The 1986 *Interagency Grizzly Bear Committee (IGBC* 1986, p. 3-5*) Guidelines* outline five "Management Situations" (MS's), three of which (MS 1, 2, and 3) apply to areas in and around recovery zones and two of which (MS 4 and 5) apply to areas further afield. The *Helena Forest Plan (HFP)* has mapped the areas where Management Situations 1 and 2 apply (namely, inside the NCDE Recovery Zone) but it has not done

so for Management Situations 3, 4, and 5 (since their introduction post-dated the release of the *HFP*). The status of these latter three management situations in any given area is often in a state of flux, due to shifts in human settlement, roading, recreational activities, vegetation conditions, bear distribution, and so on. As a result, their site-specific delineation has been left to biologists at project level as needed.

Given the small number and ephemeral distribution of grizzlies in the Divide landscape, the management situation that most often applies (irrespective of the area's status as a Distribution Zone), is MS 5. Although the description of MS 5 in the *Guidelines* is an imperfect fit for much of the landscape, it comes the closest of the 5 management situations. Population and habitat conditions for MS 5 are described as follows: "Grizzlies do not occur, or occur only rarely in the area. Habitat may be unsuitable, unavailable, or suitable and available but unoccupied. The area lacks survival and recovery values for the species or said values are unknown….." (IGBC 1986). A primary element that reduces suitability of grizzly bear habitat in the Divide landscape is the density of roads and motor trails. Management direction for MS 5 is that grizzlies are to be given deference up to a point but are subject to "control" in cases of conflicts with humans. Maintenance of habitat for grizzlies is an "option" but "is not directed".

Linkage Zone Considerations

An objective of the 1993 Recovery Plan has been to develop management tactics that will help remove limiting factors retarding population recovery. One such factor is the presence of unsuitable habitat and barriers to movement (roads and motor trails being a prime example) in linkage zones between recovery zones (USDI 1993). The Divide Landscape is not identified as a primary linkage zone in the Recovery Plan or in recent modeling efforts (Servheen *et al.* 2003; Walker and Craighead 1997), mostly because of "intense roading in the Helena National Forest" (Walker and Craighead 1998). However, increasing observations of bears throughout the landscape since the 1990s suggests that it may in fact be functioning in this way (J. Jonkel, personal communication 2007; Servheen 2005). Limited DNA sampling has found that grizzlies as far south as Elk Park just north of Butte and the Anaconda Range have come from the NCDE—possibly having moved through the Divide landscape to get there (J. Jonkel, personal communication 2007, 2012).

Grizzly Bear Area Use

The Divide Landscape in General

Grizzly bears have been observed throughout the Divide landscape numereous times over the past 20 years [HNF wildlife observation data base; MFWP records (Helena Area Resource Office)]. A majority of observations have come from the northern half of the landscape toward the Northern Continental Divide Ecosystem (NCDE) Recovery Zone and have probably been of transient bears. Some of these animals have been recognized from one year to the next and are assumed to be bears that den and center much of their activity in the Blackfoot landscape on the Lincoln Ranger District but that range southward during part of the year.

Most, though not all, observations south of Highway 12 have been in the upper reaches of the Little Blackfoot watershed and along the border between the Helena NF and the Beaverhead-Deerlodge NF (including the upper Cataract and Basin Creek drainages just to the south). The number of credible grizzly bear reports in these areas has been increasing in recent years as the population in the NCDE expands to the point that more bears are exploring new territory further to the south (J. Jonkel, personal communication, 2007). Recent monitoring efforts designed to identify individual grizzlies through DNA analysis of hair samples collected from rub trees (2009-2010) has yet to turn up any sign of the bears south of Highway 12, however—a further indication of their scarcity in this area.

The tally in Table 3.50 is incomplete, but it includes most credible observations made by or reported to HNF and Helena area MFWP biologists from 1991 to 2012. Most of the reports are from the Helena NF, but 7 observations are from south of the Forest boundary on the Beaverhead-Deerlodge NF—one being a

series of close-up photos from a camera station on the Continental Divide south of Electric Peak in 2012; another being a grizzly short in the Boulder river Drainage further to the south [both, obviously, verified occurrences]. Reports that were vague or otherwise dubious were eliminated, and those deemed credible by professional wildlife specialists or that seemed reliable for other reasons were retained. The actual number of grizzlies that have ranged into the Divide landscape since 1991 is considerably less than these totals might suggest since some of the bears have been observed and tallied multiple times over 20 years.

Table 3.50 Credible observations of grizzly bears in the Divide landscape reported 1991-2012

Area	Observations from HNF Records	Additional Observations from MFWP Records	Total Observations 1991-2011
North of U.S. Highway 12	22	22	44
South of U.S. Highway 12	12	23	35
Divide Landscape Total	34	45	89

North Divide

The northern half of the Divide landscape is an area still in transition with regard to its role in grizzly bear recovery. Although it lies adjacent to the Blackfoot landscape where a resident grizzly population has been established for several decades, only its northernmost reaches—the Little Prickly Pear watershed—may accommodate resident bears (animals that either den in the upper drainages or spend much of their active spring-summer-fall season there). Bear activity in the rest of the landscape appears fluid, associated with long-distance dispersal or with wide-ranging seasonal forays beyond core home ranges to the north. The number of bears likely to be present in the northern Divide landscape at any given time is unknown. But, two decades of fortuitous observations and occasional targeted field checks suggest the following:

- In spite of the fact that the original grizzly bear "Distribution Zone" extends southward to Mullan Pass, there is currently no bonafide "resident" population in the area south of the Little Prickly Pear watershed (at the northern end of the Divide landscape).
- Bears observed in most of this area appear to be either transient animals moving southward through a linkage zone or those with ranges centered further north (the Lincoln Ranger District) that sometimes range southward.
- Neither denning nor reproduction has been documented in the Divide landscape between the Dog Creek/Little Prickly Pear divide in the north and the upper reaches of the Little Blackfoot watershed to the south.
- The north Divide landscape is therefore not currently part of a Biological Activity Center for grizzlies [which requires that adult female bears with cubs be observed 5 out of 10 years (*HFP, Appendix E*)].

South Divide

Grizzlies in the southern half of the Divide landscape on the Helena NF also range through the drainages flowing southward into Boulder River on the Beaverhead-Deerlodge NF. The bounds of this local bear range are amorphous and probably shifting. The area within which grizzly bears have been reported between U.S. Highway 12 in the north and the main stem of Boulder River in the south covers roughly 350 mi^2 (224,000 ac) within National Forest boundaries.

Although rural residences, open roads, motor trails, developed recreational facilities, livestock grazing, mining operations, and other human activities are spread through this block of territory, ample portions of it are unroaded or lightly roaded. While the area is not sufficiently untrammeled to serve a as Recovery Zone, the fact that grizzlies have persisted here for at least two decades (albeit in very low numbers) suggests that it has a role to play in the recovery process—potentially providing local Biological Activity Centers or linkage between designated Recovery Zones. Large portions of this part of the landscape are in fact less roaded, less logged, less grazed, and currently infused with lower levels of human activity than the original Grizzly Bear Distribution Zone north of U.S. Highway 12 [see the summary status of large non-motorized habitat patches in the previous section on *Connectivity and Fragmentation*].

As with the area north of Highway 12, the southern half of the Divide landscape is still very much in transition with regard to its role in grizzly bear recovery. At this time, the size of the local grizzly "population" is unknown and its status uncertain. All that can be said, based on field observations to this point, is that:

- Population density is very low (only 5 verified occurrences in the general area 2004-2012—although several additonal observations are highly credible).
- Reproduction is uncommon (4 reports of a sow with cubs since 1991).
- The stability and persistence of the current population may be tenuous (since the presence of grizzlies may be indicative of a linkage zone with transient individuals rather than an incipient Biological Activity Center) [*HFP, Appendix E*].

Canada Lynx

Biological Factors

Population Parameters and Habitat Relationships

The Canada lynx (*Lynx canadensis*) is confined to regions of North America with cold, snowy winters. Core populations are centered in Canada with persistent peripheral populations across the northern tier of the lower 48 states and a patchy southward extension along the Rockies. Lynx inhabit coniferous forests capable of supporting snowshoe hares as a prey base: In North America, the distribution of lynx is nearly coincident with that of snowshoe hares (Ruediger *et al*. 2000). In the northern Rockies, most lynx occurrence is associated with conifer forests dominated by lodgepole pine, subalpine fir, and Engelmann spruce in the 4900-6550 foot elevation zone. Secondary interspersed vegetation includes Douglas-fir, grand fir, western larch, and aspen. Dry forest types, such as ponderosa pine and dry Douglas-fir seldom provide suitable lynx habitat (Aubry *et al.* 1999).

Females establish maternal denning sites in a variety of forest structures ranging from mature and old-growth coniferous forest to young regenerating stands (USDA 2007a, p. 16). In all cases, the key component of lynx den sites appears to be the abundance of coarse woody debris, not the age of the forest (Mowat et al. 2000). Middle-aged conifer stands (40-120 years old) with open understories and sparse deadfall do *not* provide good denning or foraging environments but often serve as travel habitat (Koehler and Aubry 1994).

Lynx usually avoid large unforested areas and prefer to move between primary habitat sites under cover of mature forest, dense early-seral forest, or tall shrubs, typically following ridges or riparian zones, and moving through saddles. Based on fieldwork in north-central Washington, Koehler (1990) surmised that openings created by regeneration harvest, where the distance to cover was more than about 325 feet (100 meters), might restrict local lynx movement and habitat use patterns until forest cover had regrown. On the other hand, research has documented many instances of lynx crossing unforested openings (Roe et al. 2000, cited in USDA 2007a, p. 10). Lynx will move across extensive non-forested areas as needed during dispersal or other long-range excursions (Koehler and Aubry 1994, p. 88; Ruediger et al. 2000, p. 1-

12; Aubry et al. 1999, p. 379), although they prefer to travel through forested habitats or along forest edges (Squires et al. 2013; Ruediger et al. 2000, ch.1 p.4; Mowat et al. 1999). Lynx seldom forage in open habitats, most likely because preferred prey species are uncommon there (Maletzke et al. 2007).

Snowshoe hares are the primary prey, making up anywhere from 35% to 97% of lynx diet. Koehler (1990) reports that snowshoe hare densities are correlated with densities of trees and shrubs less than 1.0 inch dbh. Preferred lynx foraging habitat consists of dense young conifer growth, either in early seral stands or in mature forest understories, that provides cover and browse for hares (Koehler 1990). Koehler and Brittell (1990) recommend that seedling/sapling stands in the lodgepole/subalpine fir zone be well dispersed to provide optimal lynx foraging. Squires (2010) found that in the Seeley Lake region of western Montana, lynx hunted for hares primarily in mature, multi-storied spruce-fir forest in winter and in dense early-seral stands in summer. He cautioned, however, that in southern lynx populations, regional and local habitat differences were likely to generate variations in lynx foraging patterns: a number of southern populations depend primarily on early successional forests year-round, and some inhabit primarily lodgepole pine rather than spruce-fir forests (McKelvey et al. 1999; Aubry et al. 1999, p. 8). These differences are a function of the local availability of key forest types and the distribution of snowshoe hares among them (Maletzke et al., p. 1473; Squires et al. 2010, p. 1656).

In the mountains of Montana and further south, lynx prey on a wider diversity of species than northern populations because of lower hare densities and the presence of different small mammal communities. Potential alternate prey includes red squirrels, jackrabbits, cottontails, woodrats, marten, marmots, ground squirrels, chipmunks, mice, voles, and grouse (Buskirk et al. 1999b, p. 408-409; Aubry et al. 1999, p. 375-378). Of these, red squirrels are, in most locales, the most important (Ruediger et al. 2000, ch.1 p.8-10; Buskirk et al. 1999b, p. 408-409). Field research indicates that while lynx will opportunistically take advantage of the full array of potential prey species in summer, they focus almost entirely on snowshoe hares in winter whenever they are abundant (Aubry et al. 1999, p. 378).

Lynx are highly susceptible to declines in the prey numbers. When hare populations are low, many lynx are unable to raise litters successfully, and in some cases, adults are unable to sustain themselves. As a result, local populations decline (Koehler and Aubry 1994). The other principal natural cause of mortality is conflict with larger carnivores, most notably, mountain lions (Squires, unpublished data, 2009; Buskirk et al. 1999a, p. 89-95). Among human caused mortality factors, trapping has historically been primary. Heavy trapping throughout the 19th and 20th centuries extirpated lynx from many areas of the Rocky Mountains where they had once been consistently present, and in some areas, common. Montana set restricted trapping seasons for lynx from 1991-1998 and then suspended trapping after the 1998-1999 season (Ruediger et al. 2000). Lynx are still taken incidentally in traps set for wolves, coyotes, and other large/mid-sized carnivores. Lesser mortality factors in recent decades have included disease, shooting, and roadkill (USDA 2007b, p. 2; Squires and Laurion 1999, p. 10).

Despite this plethora of mortality factors, lynx population numbers in western Montana do not appear to have declined appreciably in recent years—increasing slightly in some areas, decreasing in others. Based on monitoring of 129 lynx over a 10 year period (1998-2007), Squires (unpublished data, 2010) concluded that the lynx population in the Seeley Lake region of west-central Montana has been inching downward while the population in the Purcell Mountains in the northwest corner of the state has been increasing slightly. These are preliminary conclusions, and population data on lynx in the Rocky Mountain region of the U.S. and southern Canada remains sparse and inconclusive. It can be said, however, that these southern lynx populations are substantially smaller than those of the boreal forests of northern Canada and Alaska (because snowshoe hare populations are much smaller and more fragmented). On the other hand, southern lynx populations appear to be more stable (Aubry et al. 1999, p. 15-18).

As solitary, wide-ranging predators, lynx in both northern and southern ranges maintain low population densities relative to most other North American carnivores. Home range size varies primarily with the

dispersion pattern of suitable habitat, the abundance of prey, lynx population density, and the intensity of trapping (Koehler and Aubry 1994, p. 89-91). In Montana, Brainerd (1985, cited in Koehler and Aubry 1994) has reported home range sizes of about 17 mi^2 for females and 122 mi^2 for males. Nellis (1989) concludes that most home ranges fall between 5-20 mi^2. In northern populations where hares are more abundant, home ranges are typically smaller (Squires and Laurion 1999, p. 347).

Lynx have been documented throughout the mountains of western Montana from the Canadian border into the Yellowstone area. Current distribution is disjunct, and a number of areas that support what seems to be extensive blocks of suitable habitat are unoccupied. On the other hand, some localities that appear to have little classic lynx habitat may be supporting small local populations or serving as linkage zones through which lynx move. On the Helena NF, the most robust lynx habitat and resident population is in the Blackfoot landscape of the Lincoln Ranger District. The Divide landscape supports a sparse but apparently persistent population. While some of these animals are probably transients, winter tracking surveys backed by DNA analysis of scat and hair over the past 5 years indicates that others are long-term residents (Gehman 2006; Gehman *et al.* 2007-2010; Pilgrim 2009-2010; Pilgrim and Schwartz 2007-2008).

Influence of Roads

Koehler and Aubry (1994) identified road management as an important aspect of managing lynx habitat. Construction of Forest roads destroys local habitat for some lynx prey species (mature forest for red squirrels) and creates new opportunities for others (edge and, eventually, dense young conifer habitat for snowshoe hares). Lynx are not averse to hunting along the roads and using them for travel—a behavior that can make them more vulnerable to human-caused mortality. Rarely, lynx may be shot from roads or killed by vehicles on some of the primary gravel roads that allow higher speeds (typically county roads on the HNF).

Occasionally, lynx are caught in traps along roads that serve as conduits for trappers on snowmobiles. Even though lynx can no longer be targeted for trapping, they continue to fall victim to traps set for other species. Lynx are curious and opportunistic carnivores and they are likely to check out any baited traps along one of their travel routes. Roads that allow vehicle access to lynx habitat in winter—plowed routes or snowmobile trails—may serve as travelways for carnivores that compete with lynx (esp. bobcats and coyotes) and that would otherwise be unable to probe into lynx foraging areas in winter (Ruediger *et al.* 2000; USDA 2007b). The significance of such competition is still open to debate, but it may not be as severe as initially hypothesized (see USDA 2007b, p. 22-25; Kolbe *et al.* 2005).

Most research suggests that the types of roads managed by the Forest Service seldom adversely affect lynx directly (USDI 2007). Vehicle strikes are unlikely because of the relatively low speeds most vehicles are forced to travel and the meager traffic volume. Ruggiero *et al.* (2000) concluded that the evidence accumulated to date suggests that lynx do not avoid roads. In fact, the *Northern Rockies Lynx Management Direction* (USDA 2007b, p. 27) concluded that one of the primary efforts of Forest road management should be to eliminate shrub growth, young conifer thickets, and other habitat features that might support hares and thus attract lynx to the road corridors. Studies also show that Forest road density does not appear to affect lynx habitat selection (McKelvey *et al.* 2000; Ruediger *et al.* 2000).

Lynx Management

Management Direction

The Canada lynx was listed as a threatened species in 2000 and is now managed via the *Northern Rockies Lynx Management Direction* (*NRLMD)* (USDA 2007a, 2007b, 2007c, 2007d), which has been amended into forest plans in the northern Rockies. Attachment 1 in the *Record of Decision* for the *Management Direction* (2007b) displays 13 objectives, 7 standards, and 24 guidelines designed to achieve the goal of conserving the Canada lynx. These are divided among 5 categories: All management practices and

activities (ALL), vegetation management (VEG), livestock management (GRAZ), human use projects (HU), and linkage areas (LINK).

Six of the 12 guidelines that address human use projects are potentially relevant to travel management: Guidelines HU G6 and HU G8 deal with upgrading and maintenance of *existing* Forest roads; guidelines HU G7 and HU G9 address the placement, design, reclamation, and closure of *new* Forest roads; guideline HU G11 restricts expansion of over-snow routes (mostly snowmobile trails) in lynx habitat; and guideline HU G12 limits winter access for non-recreation special uses and for mineral and energy projects to designated routes in lynx habitat.

Two other directives of potential relevance are in sections addressing linkage areas and "all" management practices and activities. These are (1) Standard LINK S1, which mandates identification of potential lynx highway crossings when highway construction or reconstruction is being contemplated in identified *linkage areas;* and *(2)* Guideline ALL G1, which advocates pursuing methods to minimize effects on lynx from construction or reconstruction of highways.

Lynx Analysis Units (LAUs)

The basic units for analyzing the effects of management actions on lynx are *lynx analysis units* (LAUs)—areas about the size of individual female lynx home ranges. The rationale for defining units on this scale are discussed in the *Canada Lynx Conservation Assessment and Strategy* (Ruediger *et al.* 2000, p. 7-2). The Helena NF delineated LAUs for the Divide landscape in 2000 as follows:

Table 3.51 Delineated LAUs for the Divide Landscape in 2000

LAU	LAU Location	LAU Total Acres	Lynx Habitat Acres	% of LAU in Plan Area
di-01	Little Prickly Pear Crk–Ophir Crk	37,260	18,669	46 %
di-02	Dog Crk – Greenhorn Mtn	41,855	10,618	100 %
di-03	Spotted Dog Crk – Blackfoot Mdws	46,105	24,644	100 %
di-04	Telegraph Crk – Ontario Crk	28,280	20,154	100 %
di-05	Tenmile Crk	36,530	16,632	100 %
di-06	South Helena – Quartz Crk	46,485	12,512	17 %
Total	Divide Landscape	236,515	103,229	75 %

Delineating Lynx Habitat

Most objectives, standards, and guidelines in the *Lynx Management Direction* apply only to designated lynx habitat within LAUs on National Forest System lands (*NRLMD,* Attachment 1, p. 1-6). The HNF delineates lynx habitat based on information in the timber stand database and satellite imagery (the Region 1 VMAP database). In the Divide landscape, potential "lynx habitat" consists of cool, moist coniferous forest habitat types—in any stage of development—on HNF land above 5,500 ft. These are environments that we feel are likely to support habitat components suitable for lynx denning and foraging or that can be expected to develop such characteristics over time. In most Divide landscape LAUs, only a small percentage of "potential" habitat currently supports vegetation structure that provides for effective lynx denning and foraging.

Within potential lynx habitat, the HNF has delineated snowshoe hare habitat as the key component—that is, dense stands of young conifers capable of providing hiding cover and enough overhead structure to create under-snow shelter and feeding enclaves. These conditions occur in young sapling conifer stands (*stand initiation structural stages*) and in the understories of mature forests (*multistoried structural stages*).

Delineating Occupied Habitat

The *Lynx Management Direction* applies to National Forest lands "occupied" by the lynx. On the Helena NF, the Blackfoot and Divide landscapes are considered to be "occupied"; the Big Belts and Elkhorns landscapes are not [*Lynx Mgmt Direction* ROD (USDA 2007b, Attachment 1)]. In the Divide landscape, areas north of U.S. Highway 12 are categorized as "core" occupied habitat and those south of the highway as "secondary" occupied habitat [Northern Rockies Lynx Planning Area Map (USDA 2007a)]. Preliminary objectives for "secondary" habitat areas are somewhat different than those for "core" areas (USDA 2007c, p. 3-4), but the HNF applies *Management Direction* standards and guidelines to both areas in the same way.

Critical Lynx Habitat

The USFWS *Final Rule* (50 CFR Part 17) designating "critical" habitat for lynx in the contiguous U.S. (*Federal Register*, Vol. 74, No. 36, Feb. 25, 2009) has been in effect since March 2009. It expands upon previous mapping efforts and designates approximately 101,000 acres of critical lynx habitat in the contiguous 48 states, 26,200 acres of which are in the northern Rockies. The critical habitat designation is based on field research and professional opinion. On the Helena NF it takes in the entire Blackfoot landscape (Lincoln Ranger District) and the northern half of the Divide landscape (north of U.S. Highway 12). Critical habitat includes all National Forest land: (1) the previously designated area of "occupied core lynx habitat" and (2) all of the surrounding and intervening non-lynx habitat—"matrix habitat" that may provide linkage.

In addition to designating critical habitat, the *Final Rule* identifies "physical and biological features that are essential to the conservation" of lynx: that is, "primary constituent elements" (PCEs). The overarching PCE for lynx critical habitat is "boreal forest landscapes supporting a mosaic of differing successional forest stages". These landscapes contain (a) snowshoe hares and their "preferred habitat conditions, which include dense understories of young trees, shrubs, or overhanging boughs that protrude above the snow, and mature multi-storied stands with conifer boughs touching the snow surface"; (b) "winter snow conditions that are generally deep and fluffy for extended periods of time"; (c) "sites for denning that have abundant coarse woody debris, such as downed trees and root wads"; and (d) matrix habitat (not supporting hares) "that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel though such habitat while accessing patches of boreal forest within a home range" (*Federal Register*, Vol. 74, No. 36, p. 8638).

The *Rule* indicates that "lands within critical habitat will require some level of management to address the current and future threats to the lynx and to maintain and protect the physical and biological features essential to the conservation of the species" (*Federal Register*, Vol. 74, No. 36, p. 8638). That is, management actions need to maintain the PCEs. The USFWS is to decide whether a proposed Federal action amounts to "adverse modification" of lynx habitat based on whether it allows "the affected critical habitat to remain functional…to serve the intended conservation role for the species" (*Federal Register*, Vol.74, No. 36, p. 8644).

At this point, the HNF, knowing that lynx are in fact resident in the "non-critical" habitat zone south of Highway 12, applies the standards and guidelines of the *NRLMD* to all areas of the Divide landscape. While the PCE guidance does not currently apply to the region south of Highway 12, the HNF takes it into account when planning projects in this area.

Local Status

Lynx Survey Work and Field Observations

The HNF wildlife data base shows 12 observations (or groups of observations) of lynx or lynx tracks in the 6 Divide landscape LAUs since 1999 that have been verified or are considered highly credible (by MFWP and/or HNF biologists). These include an adult lynx photographed in a tree in Hahn Creek in 2006 and a juvenile female killed on Highway 12 west of MacDonald Pass in 2003. Other reports have come from these areas, but their credibility is unclear (HRD/ HNF wildlife observation files). In particular, a number of reports of "unknown credibility" from LAU di-01 probably represent valid lynx sightings, given the proximity of that LAU to high quality habitat on the Lincoln Ranger District.

In addition to these fortuitous observations, data is available from systematic tracking surveys conducted by MFWP along the Continental Divide between Boulder River in the south and Bullion Parks/ Jericho Mountain in the north (B. Giddings, personal communication; HNF/ HRD observation files). Most lynx tracks encountered in these surveys over the past 15 years have been in the Boulder River drainage a few miles south and east of the HNF boundary. But, some are from the Continental Divide trail (CDNST) where it runs along the HNF/ B-D NF line.

Since 2006, Wild Things Unlimited of Bozeman has been running winter track surveys over a wide area north and south of MacDonald Pass. The surveys have identified several carnivores in the last 4 years, but the primary targets have been wolverines and lynx. Most fieldwork has been done in the Little Blackfoot and Telegraph drainages south of the pass, but areas along the Divide toward Greenhorn Mountain and in the upper Tenmile drainage have been surveyed as well. Surveys involve systematic back-tracking and collection of hair, scat, and urine samples, which are then sent to the USFS Rocky Mountain Research Station in Missoula for DNA analysis (see Gehman 2006; Gehman *et al.* 2007-2010; Pilgrim 2009-2010; Pilgrim and Schwartz 2007-2008). DNA analysis allows identification of species and individual animals.

In the winter of 2007-2008, Wild Things Unlimited tracked lynx through the greater Telegraph Creek drainage (Telegraph Creek, Hahn Creek, Flume Gulch, Mike Renig Gulch) [LAU DI-04] and cataloged resting sites and prey kill sites (Gehman *et al.* 2008). The Rocky Mountain Research Station confirmed that a majority of the tracks had been made by a single adult male (Pilgrim and Schwartz 2008). A number of the samples from this area could not be identified to individual, but their pattern suggested the presence of a second lynx. This data supports earlier reports by longtime residents of Telegraph Creek that lynx have been present in the area for some time (HNF wildlife observation files). The Mike Renig/ Flume Gulch data are also in line with photos taken of an adult lynx in that area in 2006 (HNF and MFWP wildlife files).

In the winter of 2008-2010, Wild Things Unlimited tracked lynx through accessible portions of the Little Blackfoot and Telegraph drainages [LAUs DI-03, DI-04], and also following animals into upper Minnehaha Creek in the Tenmile drainage [LAU DI-05] (Gehman *et al.* 2009). DNA labwork on samples from these surveys identified the same male that had been present in 2007-2008, in addition to an adult female. More limited survey work around Greenhorn Mountain north of Highway 12 yielded no definitive results for lynx [although wolverines were found]. Fieldwork in the winter of 2009-2010 again found numerous signs of adult lynx in the Telegraph Creek drainage. DNA analysis verified the presence of the same adult male that had been in the area the previous 2 years (Pilgrim 2010). Lynx tracks were also followed in the Mullan Pass area north of U.S. Highway 12, but no DNA samples were taken (Gehman *et al.* 2010). Behavior patterns deciphered during four seasons of tracking, coupled with the fact that at least one lynx has been present for three years, is a strong indication that some of these animals are local residents rather than transients lingering in the area as they make their way through a linkage zone.

Snowmobile Trails in Lynx Habitat

Of the 426 miles of regularly-used snowmobile routes in the travel planning area, approximately 349 miles are specifically identified for snowmobile use under the current travel plan (Table 3.54). Another 77 miles, although shown on the Forest Visitor Map as closed to motorized use year-round, have been regularly used by snowmobiles for the past 25 years. In the absence of any evidence of resource damage or conflict with other resources, this use has not been challenged by the HNF. [For a more complete discussion of how snowmobile routes have been classified, see the lynx "*Effects"* section and Tables 3.54 and 3.70; See also the map of *Snowmobile Routes on the Helena National Forest* for 2003 and maps for travel plan alternatives].

Snowmobile trail mileage is a relevant parameter because it figures into *NRLMD* Guideline HU G11 (expansion of designated over-the-snow routes). Table 3.52, below, compares the mileage of regularly used snowmobile routes in potential lynx habitat in the "core occupied habitat" region north of U.S. Highway 12 and the "secondary occupied habitat" region south of the highway. These data are for the Divide travel planning area only and do not include those portions of LAUs di-01 and di-06 that fall outside the Plan Area. An estimated 165 miles of active snowmobile trails currently pass through potential lynx habitat, resulting in a trail density of 1.45 mi/mi² in these areas. This trail system has been relatively stable over the last two decades.

Table 3.52 Regularly used snowmobile routes in potential lynx habitat in the Divide Travel Plan Area—the area north of U.S. Highway 12 classified as *core habitat*, the area south of the highway classified as se*condary habitat*.

Occupied Lynx Habitat	Area of Potential Lynx Habitat	Miles of Snowmobile Trail in Lynx Habitat	Snowmobile Trail Density in Lynx Habitat
North of Highway 12	32 mi²	70 mi	2.2 mi/mi²
South of Highway 12	81 mi²	95 mi	1.2 mi/mi²
Total Travel Plan Area	114 mi²	165 mi	1.4 mi/mi²

Road miles/densities within LAUs are not addressed by standards or guidelines in the *NRLMD.* So, those figures are not provided here. Open road density data for elk and grizzly bear units elsewhere in this report (Tables 6, 9, 20, 21, 28) give a sense of relative road densities in LAUs.

Sensitive Species

Species Present

The following discussion focuses on *sensitive species* that inhabit the Divide travel planning area. The most recent version of the USFS Region 1 Sensitive Species List (August 2012) includes 4 HNF species not listed prior to 2013: the bighorn sheep and three bat species—the fringed myotis, long-eared myotis, and long-legged myotis. Of these, the bighorn sheep is not present in the Divide landscape. The three bats, while present in the Divide landscape, are "sensitive" only in South Dakota and Idaho, and so are not discussed here. Likewise, the pygmy nuthatch, which was recently added to the list and which inhabits the Divide landscape, is sensitive only in Idaho.

Sensitive species known or suspected to be resident in the Divide landscape (gray wolf, wolverine, fisher, black-backed woodpecker, flammulated owl, western toad) are discussed both in this introductory section and in the "*Effects"* analysis later in this report. Species likely to be directly and measurably affected by

travel plan alternatives or that inherently generate public controversy are discussed at greater length. Sensitive species that have *not* been observed in the Divide landscape or that pass through only occasionally as transients are summarized briefly in the following section, but they are not discussed further.

It should be noted that the North American wolverine, currently a sensitive species known to be resident in the Divide landscape, was designated a *candidate species* for inclusion on the Endangered Species List by the U.S. Fish and Wildlife Service (USFWS) in 2010. It is expected to be listed as a threatened species sometime in 2014, at which time new management guidance will apply.

Species Not Present

Sensitive species that are resident elsewhere on the HNF but have not been identified as such in the Divide landscape are the bighorn sheep, Townsend's big-eared bat, fringed myotis, bald eagle, peregrine falcon, and plains spadefoot toad. The northern bog lemming and harlequin duck are suspected to occur on the Forest, but have not been positively identified as present.

Bighorn sheep inhabited the Divide landscape historically but have not been present since the late 19th or early 20th century. There is a certain amount of suitable habitat in the travel plan Area, but so far, MFWP has chosen not to reintroduce the sheep and none have migrated in from neighboring regions. Bighorn sheep populations are at risk primarily from disease. Travel management issues for the sheep are similar to those affecting elk and mule deer—although on a more limited scale and in a different assortment of habitats.

The Townsend's big-eared bat has not been found in the Divide landscape. Bat surveys conducted on the HNF in recent years have found big-eared bats in the Big Belt Range to the east but not elsewhere on the Forest [Point Observation Database, Montana Natural Heritage Program (http://mtnhp.org/tracker/HNTMap.aspx)]. Road construction may destroy potential roosting sites in large decadant trees, but once in place, roads and motor trails have not been demonstrated to have any direct effect on these bats. Indirect effects may occur where travel routes facilitate human access to bat caves, abandoned mines, and large snags.

Northern bog lemming habitat is present but highly fragmented and uncommon. Bog lemmings may be present on the HNF but they have not yet been been reported here. The best habitat is on the Lincoln Ranger District west of the Divide. Management of roads and motor trails in higher elevation riparian and wetland areas is directly related to the welfare of this species.

Bald eagles are occasionally reported in the Divide landscape, but so far, only as transients. For several years a pair nested west of the Forest boundary along Snowshoe Creek, but these birds spent virtually all of their time along the lower Little Blackfoot River on private and State land. This nest is no longer active, but bald eagles are still regularly reported along the lower Little Blackfoot River several miles west of the HNF boundary. Potential nesting, roosting, and foraging habitat is available on the Forest, in particular, along the upper Little Blackfoot River, but to date no eagles have chosen to occupy it. The *Montana Bald Eagle Management Plan* contains guidelines for road management and human access around nest sites that would guide management if eagles were to establish themselves in this part of the Forest.

Peregrine falcons have been reported in the Divide landscape at various times over the past 20 years—mostly in the vicinity of Mount Helena and around Sheep Mountain just east of the HNF boundary near Clancy. Most observations have been during during the spring and fall migration periods, and no eyries are known to have been established. Since 1989, when the falcons returned to the HNF, all known eyries have been in the Big Belt Range. Management of these birds focuses on keeping recreationists off the cliffs where the eyries are established. Motorized travel management is seldom an issue.

Harelequin ducks are suspected to be present on the Lincoln District of the HNF, but none have been reported in the Divide landscape. Only marginal habitat is present—mostly on the upper Little Blackfoot River. Open roads can serve to introduce human disturbance into areas of otherwise suitable habitat for these reclusive ducks.

The plains spadefoot toad has been found only along the Missouri River below Meriwether Canyon in the Big Belt Mountains. Its range just barely edges onto the HNF in an area where there are no roads.

The leopard frog, once relatively common in and around the HNF, including the Divide landscape, has not been reported in this part of Montana in nearly 20 years. It has almost certainly been extirpated, probably as a result of global factors (increased ultra-violet radiation, global warming, the spread of pathogenic chytrid fungus) in addition to local habitat change. Leopard frogs are still relatively common in parts of eastern Montana. Standard management for the common spotted frog and the western toad will take care of habitat needs for leopard frogs, if they are in fact still present.

Northern Rocky Mountan Gray Wolf

It should be noted at the outset that the legal status of the northern Rocky Mountain gray wolf (*Canis lupus irremotus*)in the Divide landscape has changed from "endangered" to "sensitive" and back again several times since the original version of this assessment was developed. Currently (early 2014), the wolf is classified as a USFS Northern Region "sensitive" species, having been removed from the Endangered Species list in Montana and Idaho by an Act of Congress in March 2011. Irrespective of this shifting legal ground, HNF management of the wolf in the Divide landscape has remained more or less constant—grounded in basic guidance of the *Wolf Recovery Plan* (1987) and the *Montana Wolf Conservation and Management Plan* (2004).

Biological Factors

Population Parameters and Habitat Relationships

Gray wolves are capable of inhabiting virtually any kind of natural habitat occupied by ungulates or other large prey in temperate regions. Acceptable habitat includes forests of all types, rangelands, shrubland, steppes, deserts, wetlands, alpine regions, tundra, and barren ground areas, as well as human-influenced environments such as agricultural lands and logged forests. Wolves do not have any particular habitat requirement other than a preference for avoiding areas with heavy human use whenever possible (USDI 1987).

Wolf packs occupy specific territories, typically ranging from 125 km^2 to 550 km^2 (Mech 1970 cited in Tucker 1988; Peterson 1977 cited in Tucker 1988). The number of individuals in a pack and the availability of prey determine territory size (USDI *et al*. 2003). Daily pack movements vary, as do seasonal movments: distances traveled are greater in winter than in summer. Lone wolves cover larger areas than packs, and their ranges may overlap two or three pack territories (Mech 1973 cited in Tucker 1988; Fritts and Mech 1981 cited in Tucker 1988).

Wolves are generally not considered migratory but they may wander great distances within their home ranges searching for prey. When local population increases, young adults disperse to new areas—the primary source of new wolves that appear regularly in the Divide landscape. Vegetative cover affects wolf survival by providing shelter for prey such as deer and elk and as a means for quickly eluding humans. In general, healthy wolves themselves need little cover to deal with heat, cold, or severe weather (Mech 1970 cited in Tucker 1988).

Wolf dens, for bearing and protecting pups, may be inhabited year after year, though pups are sometimes moved from one den to another. Den sites are typically dug in sandy and well-drained soils near near water, although they can be located in a variety of landforms (Mech 1970 cited in Tucker 1988; Fritts 1982

cited in Tucker 1988). Aside from these local site conditions, the primary condition allowing successful wolf reproduction is isolation from human meddling.

Wolves typically hunt in packs but they may do so individually as well (Mech 1970 cited in Tucker 1988; Fritts 1982 cited in Tucker 1988). Wolves prey primarily on large wild mammals such as deer, elk, moose, bison, and bighorn sheep (Kunkel *et al.* 1999; MFWP 2003). However, they are opportunistic foragers and will take advantage of other foods, including domestic livestock, dogs, small and midsized mammals (such as ground squirrels or beavers) , birds (particularly grouse and waterfowl), fish, green vegetation, and fruits, depending on their availability and ease of capture (Kunkel et al. 1999). Wolves are also successful scavengers.

Because of the impact that wolves, as top predators, may have on domestic livestock and big game populations, their presence on the Montana landscape inevitably stirs controversy. MFWP has conducted intensive research on wolf-ungulate relationships in the greater Yellowstone area (GYA) and southwest Montana (2001—2008) and continues to pursue less intensive but more widespread monitoring throughout the rest of the state (Sime *et al.* 2010, p. 25-29). They have found that while elk (particularly elk calves) are the primary wolf prey in Yellowstone and the southwest, white-tailed deer are the most common ungulate prey in the northern half of the state, including the area around Helena. They found that, in spite of much public opinion to the contrary, elk calf and adult female survival rates in most of southwest Montana and the GYA following the return of wolves have been similar to rates prior to wolf restoration. However, in certain areas with high predator-to-prey ratios (typically involving both wolves and bears, and sometimes mountain lions), elk numbers have declined substantially. These areas include the northern Yellowstone, Gallatin Canyon, and Madison-Firehole winter ranges, as well as the West Fork of the Bitterroot (Sime *et al.* 2010, p. 27).

MFWP also concluded that "some areas in Montana are unsuitable to wolves because livestock depredations continually lead to wolf removals, preventing wolves from increasing to densities that are seen in protected areas. In these areas, wolves are probably less likely to limit ungulate populations than in areas where depredation removals do not limit wolf survival and population growth" (Sime *et al.* 2010, p. 29). The greater Helena area, including the Divide landscape and its neighboring ranchlands, appears to be one of these areas where predation on livestock occurs at low levels but is an ongoing problem, and where consequent wolf removals will inevitably prevent wolves from having any measurable effect on big game populations.

Just to the north in the Big Blackfoot River Valley, an overabundance of wolves, black bears, grizzly bears, and mountain lions appears to be a primary determinent of local elk and deer population configurations. However, the same is not true for the greater Helena and Little Blackfoot Valleys that flank the Divide landscape. Elk populations are not declining in these areas, and other population parameters (calf production, bull/cow ratios) remain more or less where they have been for the past several years [see MFWP post-season aerial elk surveys for HD 343, 335, 293, 215: 1999-2011].

Most of the difficulty that hunters have had in bagging elk in and around the Divide travel planning area in recent years appears to be a function of (1) mild fall weather, which allows elk a broad spectrum of far-flung escape areas, and (2) the increasing tendency of elk to seek out private lands in the fall where they are safe from most public hunting. Elk population decline due to wolf predation is not a problem in the Divide landscape.

Influence of Roads

Wolves are not impeded or repelled by most Forest roads, and, in fact, they often use primitive roads with low traffic volume as travelways any time of year. Wolves are also attracted to road corridors that focus prey activity—as when deer graze roadside green-up or rabbits concentrate in roadside brush. On the other hand, some studies have worked out road density thresholds above which wolf pack activity is

suppressed. In Minnesota and Wisconsin, average threshold road density was determined to be 0.72 mi/mi² (Mladenoff *et al.* 1995 cited in Forman *et al.* 2003). Whether or not this density applies to montane National Forest road systems in the west has not been determined. But given the facility with which wolf packs have made use of ranchlands and well-roaded portions of the HNF in the last 15 years (weighted summer open road density in the travel planning area averages 0.81 mi/mi²), it seems likely that, at least in parts of their territories, wolves are able to deal with road densities higher than the Wisconsin thresholds.

While few roads on the HNF allow vehicle speeds high enough to threaten wolves, U.S. Highway 12 in the center of the Travel Plan area has proven deadly in the past (at least one adult having been killed on the highway near MacDonald Pass in 2002). Roads may also be indirectly lethal in that they funnel hunters and other Forest users with rifles into areas occupied by wolves, leading to inadvertant or deliberate shooting. So far, however, neither strikes on the highway nor illegal/accidental shooting have have been meaninful road-related factors in wolf mortility on the HNF since wolves began arriving in this area in the late 1980s.

Wolf Management

Wolf Recovery Plan

The Northern Rocky Mountain gray wolf (*Canis lupus irremotus)* was listed as an *endangered* species in 1973. Since 1987, wolf recovery has proceeded according to steps outlined in the *Northern Rocky Mountain Wolf Recovery Plan* (USDI 1987). The Plan was designed to provide direction and coordination for recovery efforts. It is not a decision-making document, however, and has been subject to modification as new information has become available, species status has changed, and tasks have been completed.

In 1994, the *Final Rule on the Establishment of a Nonessential Experimental Population of Gray Wolves* (50 CFR Part 17) provided for reintroduction of wolves into the Greater Yellowstone and Central Idaho Wolf Recovery Areas. It also expanded the size of the three insular wolf recovery areas delineated in the *Wolf Recovery Plan.* The Greater Yellowstone and Central Idaho Areas were enlarged to include the entire state of Wyoming, most of Idaho, and the southern half of Montana. These two areas came to be referred to as "Experimental Population Areas" rather than "Recovery Areas". The third area—the Northwest Montana Recovery Area, originally within the Bob Marshal Wilderness complex—was expanded to encompass the northern half of Montana and the Idaho Panhandle (Sime *et al.* 2008, 2009, 2010). The Divide travel planning area is located in the southwestern sector of the Northwest Montana Recovery Area.

In assessing the potential impacts of HNF projects on wolves, relevant provisions of the *Wolf Recovery Plan* were applied and the most recent research findings and management advice from MFWP and USFWS wolf biologists were looked at as to deal with specific local issues. In general, the focus was on (1) protecting active denning and rendezvous sites from human interference, (2) maintaining abundant big game as a prey base, (3) reducing factors that might lead to negative confrontation with humans (open roads, untended livestock), and (4) retaining sufficient forest cover to provide for local screening and concealment (see Oakleaf *et al.* 2006; USDI 1987).

Wolf Reintroduction and Dispersal

In 1995 and 1996, a total of 66 wolves from Alberta were introduced into the Greater Yellowstone and Central Idaho Recovery Areas. In the absence of competition from resident wolves, these animals quickly established robust populations. While the Yellowstone National Park population appeared to have stabilizedby 2009-2010, the Greater Yellowstone population as a whole was continuing to expand. Likewise, the central Idaho population continued to increase in distribution and abundance (Sime *et al.* 2008, 2009, 2010). However, the insertion of wolf hunting seasons in Idaho and Montana since 2010 has now inserted a new dynamic into the population equations, the outcome of which remains at issue.

No reintroduction has been needed in the Northwest Montana Recovery Area, as natural southward migration of wolves from Canada has been gradually populating this region since the mid 1980s—and continues to do so (personal observation: Yaak River drainage 1984-87, Big Hole Valley 1987-1992, HNF Divide and Blackfoot landscapes 1991-present) [see also Rocky Mountain Wolf Recovery Annual Reports 1995-2011; Interagency Annual Reports (Sime *et al.* 2007, 2008, 2009, 2010)]. Annual population increase in this recovery area has been varied, but the overall trend has been upward. Wolf populations in Montana as a whole increased 34% in 2007, 18% in 2008, 4% in 2009, 8% in 2010, and 15% in 2011. The current counted population stands at about 655 wolves in 130 verified packs statewide.

Increasingly, wolves are moving between the Northwest Montana and Central Idaho Recovery Areas—enough so that the two populations appear to be gradually merging (Sime *et al.* 2008). There is very little movement, however, from these areas into the Greater Yellowstone Recovery Area—a function, apparently, of low quality dispersal habitat (Oakleaf *et al.* 2006) and of the high wolf density in the greater Yellowstone ecosystem. On the other hand, wolves from the greater Yellowstone area in northern Wyoming and southern Montana are now beginning to show up in the more northerly reaches of that experimental population area and, occasionally, in the Northwest Montana Recovery Area (see examples in Sime *et al.* 2010, p. 47-67).

The Divide travel planning area lies entirely within the Northwest Montana Recovery Area, near its eastern edge). Individual wolves began to be regularly reported in the Divide landscape in the late 1980s, and the first resident pack was identified in 1995 (in the Telegraph Creek drainage of the upper Little Blackfoot watershed). The number of packs on the HNF has waxed and waned over the past 17 years, with most mortality stemming from management actions by State and Federal agencies attempting to minimize predation on livestock. Until 2010, all verified packs on the HNF had been located in the Blackfoot and Divide landscapes, which provide the primary north-south dispersal zone for wolves moving southward from northern populations. In 2010, a pack was identified in the Elkhorn landscape, and in 2011 and 2012, multiple wolves were reported in the central Big Belt landscape.

State Wolf Management and the Delisting Process 2004-2011

By the end of 2002, the biological requirements for wolf recovery in the northern Rockies had been met (at least 10 breeding packs each in Montana, Idaho, and Wyoming for 3 consecutive years). State management plans for Idaho and Montana were in place by 2004, and in 2004-2005, day-to-day management of wolves in Montana was transferred from the USFWS to MFWP. The Wyoming state plan (though considered marginal by the USFWS) was tentatively approved in early 2008, allowing the USFWS to proceed with delisting.

The USFWS removed the northern Rocky Mountain gray wolf from the Endangered Species list in February 2008. However, litigation led to a court injunction (July 2008) and, eventually, restoration of wolves to the list (October 2008). The primary rationale for this action stemmed from the relatively low genetic diversity measured in the Greater Yellowstone wolf population and the uncertainty as to longterm prospects for wolves under State management programs (Wyoming being particularly problematic).

Given these circumstances, the USFWS, after revising its original delisting order, once again removed the wolf from the Endangered Species List (May 2009)—but only in Montana and Idaho where State management plans were deemed adequate and where effective genetic interchange between subpopulations appeared to be occurring. Unlike Yellowstone, where wolves were reintroduced from two Canadian populations of Mackenzie Valley wolves, the Northwest Montana Recovery Area has been repopulated by wolves naturally migrating in from a variety of areas to the north—a circumstance that may be producing a more genetically diverse population (although this has not yet been verified by systematic studies).

Following standard procedure, USFS Region 1 then added the wolf to its Sensitive Species List. Shortly thereafter, environmental groups again took the USFWS to court seeking to reinstate endangered species status, and in August 2010, Federal District Court in Missoula ruled that the Service could not drop the wolf from the List in some states (Montana and Idaho) and continue to list it in another (Wyoming). The wolf thus returned to its pre-May-2009 status as an "endangered" species in the Divide landscape. Once again, local ranchers could take wolves actively chasing or attacking livestock only if authorized by a permit from the USFWS.

In April 2011, after a negotiated agreement between environmental groups and the USFWS to again delist the wolf was scuttled by Federal District Court, the U.S. Congress approved a measure to remove the wolf from the Endangered Species List in Montana, Idaho, and parts of Washington, Oregon, and Utah as of June 2011. While this action circumvents the traditional pathway for delisting a species (with regard to the role of the courts), the terms essentially reinstate the USFWS's 2009 science-based delisting order: That is, wolves are removed from the Endangered Species List and placed under state management in areas that support viable wolf populations and are covered by management plans designed to maintain those populations.

The upshot for the HNF is that wolves are again classified as a "sensitive" species. While this new categorization may change the way in which local ranchers deal with problem wolves around their livestock operations, it does not alter management strategy for the HNF, which will continue to manage the wolf as a relatively uncommon top carnivore within the ecosystem.

Wolf Hunting Seasons 2009-2012

In 2009, the State of Montana initiated its first "fair chase" wolf hunting season. The state was divided into three large wolf management units (WMUs) with an overall quota of 75 wolves. The hunt was initially slated to coincide with the big game rifle season (October 25 – November 29); however, the quota was reached by mid November and the season was closed at that point. Although MFWP had predicted that approximately 590 wolves would remain following the season, the year-end estimate put the population at 524 animals. This amounted to a net increment of 27 wolves over the 2008 population, but it represented an abatement in the rate of increase from pevious years (Sime *et al.* 2010).

In 2010, the planned hunt was cancelled as wolves were returned to the Endangered Species List in August of that year. In 2011, a statewide quota of 220 wolves was set across 14 WMUs. MFWP expected that if the hunting quota were met and added to mortality from other sources, the wolf population would be reduced from around 565 wolves in 2010 to around 425 animals in 2011. But even with the season being extended to mid-Feburary 2012, only 152 wolves were harvested. This, combined with fewer dead wolves via agency control (because of lower livestock losses), resulted in a year-end wolf population of about 653 animals—notably higher than the predicted 425 (Hanauska-Brown *et al.* 2012).

Given these results, the State responded in 2012 with a wolf hunting season extending from September 1, 2012 to February 28, 2013. With the exception of two of the now 17 WMUs, no quotas were set for the number of animals that could be taken. In addition, a wolf trapping season extending from December 15 to February 28 was initiated. As of late January 2013, hunters had harvested 106 wolves and trappers had taken 55 animals (MFWP website: http://fwp.mt.gov). At this point, the number of animals legally taken is in the same range as the 2011-2012 harvest—and it appears unlikely to reduce the wolf population to the extent that MFWP would like.

Although the state is divided into 17 management units and MFWP has the authority to stop hunting in any given district if local circumstances dictate, the system has so far proven unable to bring greater hunting pressure to bear on areas with real wolf predation problems (involving livestock and/or big game) and to tread lightly in areas where wolves are causing few problems. In mid-December 2012, the Department did attempt to shut down hunting in two small areas north of Yellowstone National Park

where wolves that had been collared for research purposes in the Park were being killed. A court order, however, has prevented the ban from going into effect. After four years, the wolf hunt is still a work in progress, and future adjustments to the system can be expected.

Area Use

Gray Wolf: Region-Wide Status

The wolf population in Montana has increased from around 35 animals in 1990 to over 650 by early 2012. Population numbers or the numbers of breeding pairs have decreased in some years—most recently between 2003 and 2004 and between 2009 and 2010—but the overall trend graphs out as a relatively smooth upward curve. In general, increases have been steady in the greater Yellowstone and central Idaho recovery areas and more sporadic in the northwest Montana recovery area. Recent statewide population estimates show a minimum of 497 wolves (34 breeding pairs) in 2008, 524 wolves (37 breeding pairs) in 2009, 566 wolves (35 breeding pairs) in 2010, and 653 wolves (39 breeding pairs) in 2011. The annual increase in numbers was 4% in 2009, 8% in 2010, and 15% in 2011. These compare to increases ranging from 10% to 34% between 1995 and 2008 (Sime *et al.* 2010, p. 12, 26). MFWP attibuted the smaller increment in 2009 to the first regulated wolf hunt held that year and the larger increase in 2010 to the absence of a hunt (the wolf having been temporarily put back on the Endangered Species list that year). However, MFWP tallied a 15% increase in the counted wolf population in 2011, in spite of a 4-month regulated hunt in which 165 animals were killed.

Regionwide, the USFWS has estimated that the total population in the northern Rockies was at least 1,706 wolves (115 breeding pairs; 242 packs) by the end of 2009. This is up from an estimated 1,645 wolves (95 breeding pairs; 217 packs) at the end of 2008—an increase of almost 4% (USFWS *et al.* 2010). An estimated 1,000 pups were born in these areas in the spring of 2009 (Ed Bangs, USFWS Wolf Coordinator, quoted in the Helena *Independent Record*, June 3, 2009).

Yearly increases in population have occurred in spite of a number of wolves being killed each year, mostly by USDA Wildlife Services, to reduce livestock losses: In Montana, this amounted to 110 of 168 known mortalities in 2008 and 145 of 255 mortalities in 2009. So, the annual increment in surviving young has been more than sufficient to overcome losses to natural and human-generated mortality to this point—including the loss of 72 animals during Montana's first annual wolf hunting season in the fall of 2009. The relisting of the wolf as a threatened/ endangered species eliminated the 2010 regulated wolf hunts in Montana and Idaho. But in spite of the resurrection of the hunts in 2011—with 165 wolves killed in Montana—MFWP has estimated a 15% rise in the counted population.

Gray Wolf: Local Occurrence 1995-2007

While the Montana wolf population as a whole is secure, the persistence of individual wolf packs across the landscape is dynamic, with new packs forming and established packs failing to persist for a variety of reasons (Sime *et al.* 2010, p. 12). Five wolf packs have been active in and around the Divide landscape at various times since 1995 (although 2 of the packs have formed from the remnants of previous packs).

<u>The Boulder pack</u> (1995-2000) originally denned in upper Telegraph Creek in the Little Blackfoot watershed in 1995 and then moved southward into the Boulder River drainage on the Beaverhead-Deerlodge National Forest, where it spent most of the next 5 years, sometimes ranging northward back onto the HNF. This pack preyed on livestock often enough that it was the subject of multiple control actions—a circumstance that led to its eventual demise.

<u>The Castle Rock pack</u> (2001-2003) was partially descended from the Boulder pack and centered its range west of the HNF boundary in the Spotted Dog Creek drainage. It operated on the National Forest—ranging eastward into the upper Little Blackfoot—as well as throughout the extensive private ranchland to the west. It, too, eventually concentrated enough on domestic livestock that management agencies (led by USFWS) removed all but a remnant.

The Spotted Dog pack (2004-2007) formed from a surviving female of the Castle Rock pack and a newly arrived male. It ranged through roughly the same territory as the Castle Rock pack and, like its predecessor, ran afoul of management agencies over livestock predation. It was dramatically reduced in size in 2006-2007, and no remnant members were detected after 2007.

The Halfway pack (2002-2004) was established by migrants coming down through the Avon-Helmville valley and the Garnet Mountain Range. Its local range was immediately north of the Castle Rock pack—generally north of Highway 12 in the Avon and Little Blackfoot valleys and surrounding National Forest lands. It, too, was subject to management reduction because of its proficiency in preying on livestock. It faded away about the same time as the Castle Rock pack.

The Great Divide pack (2002-2003) initially denned in the Marysville area but soon came to center its activities near the Mullan tunnel atop the Continental Divide. It was a small pack to begin with, and after its alpha female was killed on Highway 12 near MacDonald Pass in 2002, it had difficulty maintaining itself (J. Fontaine, personal communication, 2003). Field personnel from the USFWS and MFWP were unable to locate wolves in the area after 2003 and concluded that the remnants of the pack had dissipated or not survived.

Gray Wolf: Local Status 2008-2011

Since 2008, MFWP biologists have monitored a variety of wolf activity in the Divide landscape. In the fall of 2008 HNF field personnel and field trackers from Wild Things Unlimited (Bozeman) noted numerous signs of wolves in the upper Little Blackfoot watershed (Flume Gulch, Jericho Mountain, Little Blackfoot River) [HNF wildlife observation files]. Also in the fall of 2008, MFWP received reports of wolves and wolf sign from hunters in the Tenmile drainage just east of the Divide (Sime *et al.* 2009). Wolf sightings in the vicinity of Rimini in the Tenmile drainage have continued into 2011, although no pack activity has been substantiated. Individual wolves have also been sighted north of Highway 12 several times since 2008—one animal having been photographed at Priest Pass in 2009 (Sime *et al.* 2010, p. 67).

While no regular pack activity or breeding pairs have been confirmed in the Divide landscape since 2007, a group of 7 wolves was photographed near Stemple Pass just north of the Helena RD boundary in October 2010 (HNF wildlife observation file). MFWP has been monitoring several packs within a few miles of the landscape to the north, northeast, and west. Given the mobility of wolves, any of these packs could have ranged into the travel planning area in the past 4 years. Of these wolves, the Elevation Mountain pack (Garnet Range/ Avon Valley), the Nevada Creek pack (Helmville/ Avon Valley), and the Mitchell Mountain Pack (Sieben Ranch/ Little Prickly Pear Creek) had been eliminated by Wildlife Services by early 2010 following persistent livestock predation (Sime *et al.* 2010, p. 52-63; MT Wolf Program Weekly Reports 2010).

The Sixmile pack (Avon Valley—just west of the travel planning area) appeared in 2009 and was also slated for reduction because of livestock predation, but it managed to evade capture. MFWP has had difficulty locating and monitoring these animals (Sime *et al.* 2010, p. 63): The pack was composed of at least 5 wolves at the end of 2009 and at least 7 wolves by the end of 2010. Discovery of wolf-killed cattle between Avon and Helmville in June 2011 suggest that this pack remains active (MFWP Weekly Wolf Reports).

In the spring of 2011, a small group of adult wolves began preying on calves in the Little Blackfoot valley between Elliston and Avon a few miles west of the HNF. This group may have had some connection to the Sixmile pack, but it was not believed to be a coherent pack in itself (K. Glazier, personal communication, June 2011). After a period, all four animals were killed by USDA Wildlife Services at the request of MFWP in June 2011. It is not known whether members of the pack had bred and produced offspring—no natal den having been located.

Since May 2010, MFWP has been following another pack—the Canyon Creek pack—a few miles northeast of the travel planning area, somewhat south of the old Mitchell Mountain pack's territory. These animals have also been killing livestock, and Wildlife Services had removed part of the pack as of October 2010. One of the females was found to be a collared individual that had dispersed from the Greater Yellowstone ecoystem in the vicinity of Cody, Wyoming (Montana Wolf Program Weekly Reports, June—October 2010). The pack wolves continued killing adult cattle, calves, and sheep in the vicinity of Canyon Creek and on the Sieben Ranch through the summer of 2011 (although black bears killed a number of Sieben sheep in 2011 as well). Wildlife Services was authorized to kill 6 of the wolves in the summer of 2011, but by the end of the year they had dispatched only two of them (and radio-collared a third).

All of these packs, as well as most of those that have frequented the Divide landscape in the past, have eventually preyed on livestock such that USFWS or MFWP have felt obligated to remove (via USDA Wildlife Services) all or most pack members. This is one of the areas in the state where livestock predation by wolves, while not widespread, is so persistent when it occurs that wolf population densities will never approach those of backcountry and protected areas (such as Yellowstone or Glacier NPs) or other areas of high ungulate density (such as the Big Blackfoot River valley or the West Fork of the Bitterroot). Livestock depredation in and around the Divide landscape will continually lead to wolf removals. As a result, wolf impacts on local big game populations should continue to be minimal (Sime *et al.* 2010, p. 29).

Wolverine

The North American wolverine (*Gulo gulo*) is currently classified as a "sensitive" species in Forest Service Region 1. In February 2013, the USFWS proposed the wolverine for listing under the Endangered Species Act (either as a "threatened" or an "endangered" species). A decision as to whether the wolverine will actually be listed is due out within the year; but in the meantime, it will be analyzed here as an sensitive species.

Biological Factors

Population Parameters and Habitat Relationships

Wolverines are generally solitary animals. They range widely from high alpine regions to low-elevation big game winter ranges but may exhibit some fidelity to particular areas for months or years. Long-term observations indicate that the species exhibits flexible behavior when environmental conditions (such as food supply) change, leading to movement beyond normal boundaries (Hatler 1989). Wolverine habitat is best defined in terms of adequate year-round food supplies in large sparsely inhabited areas, rather than in terms of particular topography or plant associations (Kelsall 1981). However, studies indicate that wolverines select alpine fir forests over other forest types with some preference for lodgepole pine and western larch (Hornocker and Hash 1981). Copeland (1996) found that wolverines preferred Douglas-fir forests in summer and lodgepole pine forests in winter. Generally, habitat use follows distinct seasonal shifts with higher elevational talus/rock areas preferred in summer, montane conifer forests in winter, and riparian habitats in spring (Copeland 1996). Wolverines also exhibit a particular affinity for higher elevation alpine habitats that accumulate deep snow in winter.

Preferred ranges appear to be large, isolated tracts of land supporting a diverse prey base (Hornocker and Hash 1981). Wolverines will range into roaded areas with a modicum of human activity, but this use often occurs in winter when many of these areas become, because of winter conditions, "remote". During summer, wolverines typically move to higher elevations. These behaviors effectively separate wolverines and humans other than for rare encounters. Human encroachment into existing refuges may threaten the wolverine's ability to maintain basic life history requirements (Copeland and Hudak 1995). Human activity (road building, developed campgrounds) near subalpine boulder talus sites may eliminate historic foraging or denning habitat. It has been hypothesized that persistence of wolverines in Montana, despite

unlimited historic trapping and hunting, may be attributed to the presence of designated wilderness and remote, inaccessible habitat (Hornocker and Hash, 1981).

Wolverines occur in low densities in all places they have been studied. This is generally attributed to naturally low reproductive rates and delayed sexual maturity as well as the unreliability of adequate food supplies throughout the year (Banci 1994). Maintenance of large territories and susceptibility to trapping also play a role (Hatler 1989). Overall, food availability seems to be the primary factor determining movement and specific habitat use and is probably the primary limiting factor for wolverine populations (Hornocker and Hash 1981; Hatler 1989).

Although the wolverine is primarily a scavenger, it forages for most of its own food during the summer. Common foods include the eggs and young of ground nesting birds, burrowing rodents, snowshoe hares, and berries. In winter, wolverines rely on carrion, and therefore are dependent upon the presence of other predators. They establish food caches in winter, and are also adept at seeking out and raiding caches made by other wolverines and other carnivores such as mountain lions and foxes. Ungulate carrion is a primary winter food item—mountain goats at higher elevations; elk, deer, and moose at low and mid elevations (Banci 1994).

Beginning in late winter, reproducing females establish a series of dens ranging from natal dens (associated with the birth of kits) to maternal dens (post-birth, pre-weaning) and post weaning dens (rendezvous sites) (Copeland 1996). Natal dens are established at high elevations, typically in talus or cirque basins while maternal dens occur in both talus and among fallen trees (Copeland 1996). Rendezvous sites may occur in talus or coniferous riparian zones. Protection of natal denning habitat is critical for wolverine persistence.

Data collected in northwestern Montana indicate that average yearly ranges are 262 mi^2 for males and 241 mi^2 for females (Hornocker and Hash 1981). Although wolverines maintain large home ranges and can utilize almost any habitat, they are sensitive to human disturbance and are especially susceptible to trapping because of their opportunistic eating habits. Trapping accounts for a high proportion of wolverine mortality, affecting even populations that are locally protected (Squires 2007; Inman 2007; Banci 1994; Hatler 1989).

Key components of wolverine ecology revealed by research over the past three decades can be summarized as follows: (1) wolverines need adequate space to maintain populations; (2) population fragmentation must be avoided to maintain genetic, social, and spatial continuity of subpopulations; (3) the environment must be capable of providing a varied seasonal diet; and (4) security areas must be available to provide undisturbed seclusion for reproducing females (Copeland and Hudak 1995).

Recent research suggests that an additional factor of key importance to wolverines is the need for sites that retain deep snow in the spring. McKelvey and others (2010) have argued that while wolverines can be considered habitat generalists in many respects, the fact that females are highly dependent on deep snow for establishing and maintaining viable reproductive dens ties wolverine populations to areas with persistent spring snow. At present, this includes many of the major mountain ranges in the northern and central Rockies, as well as the Cascade Range in Washington and Oregon. The implication of this dependence is that wolverine habitat in western North America is likely to become smaller and more fragmented as global warming diminishes the capacity of many sites to provide suitable spring snow cover (McKelvey *et al.* 2010). This was a primary factor in the USFWS decision in 2010 to designate the wolverine a *candidate* for listing as a threatened or endangered species (USDI 2010, p. 78046).

Influence of Forest Roads and Trails

Extensive unroaded or sparsely roaded habitat is often cited as a characteristic component of wolverine habitat (Claar *et al.* 1999; Banci 1994; Kelsall 1981), but it is unclear whether this is a cause-and-effect phenomenon or simply a function of the species' tendency to inhabit higher elevation areas inhospitable

to most human development. It is also possible that more wolverines are present in large wildland areas because of lower trapping mortality than occurs among those animals frequenting environments with ready road and trail access (Banci 1994).

Research throughout the Rocky Mountain region of Canada and the northern U.S. reveals no definitive conclusions as to whether wolverines are attracted to or avoid Forest roads and trails. Krebbs *et al.* (2007) found that roads did not seem to influence habitat associations of male wolverines. Copeland *et al.* (2007) found no aversion or attraction of wolverines to maintained trails, although they noted that, wolverines frequently used snow-packed roads in their study area as winter travel routes. In reviewing other studies, they noted a general "spatial separation of wolverines and human-related infrastructure" but did not single out roads as a key factor.

The main impact of roads and motor trails on wolverines comes from their role as snowmobile routes in winter for trappers and recreationists. They allow trappers to work traplines in wolverine habitat that they would otherwise have difficulty reaching. Trapping has been cited as a primary source of wolverine mortality in a variety of studies (see Squires *et al.* 2007; Inman *et al.* 2007; Banci 1994; Hatler 1989; Hash 1987). Roadways also provide snowmobilers with pathways up to high alpine basins where disturbance of natal denning habitat is negatively impacting wolverine production in some areas (Claar *et al.* 1999; Banci 1994; Squires *et al.* 2007).

Area Use

Wolverine Habitat

According to Copeland (pers. comm. cited in Hillis and Kennedy 2003) and Squires (pers. comm. cited in Hillis and Kennedy 2003), wolverines are distributed throughout montane habitats across USFS Region-1. Highest densities are associated with the main stem of the Rocky Mountains, extending eastward to the Big Belt Range. Wolverines become relatively scarce in island and peninsular ranges east and west of the Continental Divide (Ranges such as the Castle, Little Belt, Snowy, Highwood, and Crazy Mountains to the east; the Kettle River, Wallowa, and Blue Mountains to the west).

Locally, a number of potential wolverine safe havens exist in the travel planning area both as inventoried roadless areas and as undesignated blocks of non-motorized habitat where human presence is minimal for much of the year. Such blocks larger than 1,500 acres occupy roughly 67% of the travel planning area (see discussion of Habitat Connectivity in the Divide Landscape).

While the HNF does not manage habitat specifically for wolverines in the Divide landscape, habitat management for other wildlife species serves to benefit wolverines. Ungulate carrion is a major food source, and management of elk and deer at levels sufficient to provide for hunting enhances the potential for this resource. Management for elk security also provides large blocks of non-motorized habitat that may provide incidental havens for wolverines (see previous discussion of elk security areas). In addition, management aimed at improving connectivity of wildland habitat enhances the ability of wolverines to move throughout the Divide and improves prospects for survival (see the discussion on Dispersal, Fragmentation, and Linkage).

The HNF has mapped natal denning habitat for wolverines across the Forest using a model developed by the USFS Northern Regional office (Missoula). The model focuses on identifying high mountain basins, rockslides, steep slopes, and other alpine terrain where woody and rocky debris along with deep snow are likely to accummulate. And while field investegation indicates that some areas in the Divide landscape meet these criterea (areas around Nevada and Black Mountains, Lee Mountain, Red Mountain, Cliff Mountain/ Electric Peak, Jericho Mountain, Thunderbolt Mountain, Bison Mountain, Luttrell Peak), none were identified by the model.

Most potential wolverine denning habitat in the Divide landscape is immune from snowmobile use because of land allocation status (the HNF prohibits snowmobiles in most of the Electric Peak Roadless Area, for example) or by virtue of inhospitabable terrain and forest structure that makes snowmobile travel off established trails extremely difficult, if not impossible.

Wolverine Occurrence

Reports of wolverines in the Divide landscape south of Highway 12 have been infrequent but consistent over the past 2 decades. Most observations have come from upper Telegraph Creek (from long-term local residents). Others have come from around Jericho Mountain, the Occidental plateau, and areas near Lava Mountain. In 1995, a wolverine was trapped in Cataract Basin on the Beaverhead-Deerlodge NF just south of the Helena NF boundary.

More recently, winter tracking suveys by Wild Things Unlimited (Bozeman, MT) have found wolverines along the Continental Divide both north and south of Highway 12 and in other parts of the Little Blackfoot watershed over a 4-year period (2007-2011). DNA analysis of scat and hair from 2007-2008 and 2008-2009 surveys verified the presence of two male wolverines (Gehman *et al.* 2009, p. 5; Pilgrim and Schwartz 2008; Pilgrim 2009). These animals range widely in the central and southern parts of the travel planning area and exhibit movement and behavior patterns consistent with those of local residents rather than those of transients moving through a linkage zone. In the fall of 2008, a hunter photographed a large adult wolverine on an elk gut-pile in the vicinity of Greenhorn Mountain north of Mullan Pass. Track surveys in 2008-2009 identified fresh wolverine sign in this area as well. In the past, wolverines have been reported just north of the travel planning area in the upper Little Prickly Pear drainage and on the Lincoln Ranger District. Surveys from 2009-2011 have continued to locate wolverines in the same general areas as in previous years. So, it is likely that wolverines have been resident in the Divide landscape in low numbers for several years. Breeding activity, however, remains an unknown quantity.

Fisher

Biological Factors

Population Parameters and Habitat Relationships

The fisher (*Martes pennanti*) is a small to mid-sized carnivore strongly associated with structurally complex forest stands, most often at low and middle elevations rather than in high montane forests (Powell and Zielinski 1994). In the Rocky Mountains, fishers most often use stands dominated by grand fir, Engelmann spruce, and lodgepole pine (Jones 1991). Old-growth and mature riparian forests provide particularly good habitat. Fishers make use of hollow logs, standing tree cavities, and dense tree crowns (often witch's brooms) for denning, rearing young, resting, and general refuge (Jones 1991). They prey on a variety of small and mid-sized mammals (snowshoe hares, porcupines, squirrels, voles), as well as birds, and carrion (Heinemeyer and Jones 1994). This diverse diet makes them less vulnerable to shifts in prey abundance than lynx and other predators that rely heavily on one or two prey species.

Like lynx and marten, fishers avoid large openings (parks, meadows, early-seral clearcuts, and burns). Also, like other forest carnivores, fishers maintain low population densities and range widely in search of prey and of key habitats (structurally complex forest) (Powell and Zielinski 1994). Because of their aversion to openings, they seek out forested connections between the habitat sites in which they focus activity (Powell and Zielinski 1994). These connecting habitats may consist of any number of forest formations and seral stages and do not necessarily exhibit the complex structure and prey density of preferred habitat sites (Heinemeyer and Jones 1994).

The importance to fishers of riparian and wetland forest has been noted by researchers in several areas of North America, including Idaho (Jones 1991) and Montana (Heinemeyer and Jones 1994). In Montana, fishers prefer areas within 200 meters of water (Heinemeyer and Jones 1994). Investigators have

documented that riparian corridors are often used as travel routes (Heinemeyer and Jones 1994). Jones (1991) suggests that preferred resting habitat and prey are more available within forested riparian areas.

Beginning in the 19th century, fisher populations were decimated throughout most of western North America by trapping, which continued unabated into the 1930s, and by loss of key habitat to logging. Fisher populations have rebounded naturally in some areas and have been reintroduced in others (as in the Cabinet Range of northwest Montana, 1988-90). Still, fisher numbers remain low in the northern Rockies, leaving local populations more vulnerable to decimating factors than species with larger, more diverse populations. Given its inherently low population density, the fisher is likely to remain on the Northern Region Sensitive species list for the foreseeable future. A recent biological status review by the USFWS has determined that the fisher population in the northern Rockies of the U.S. (Idaho and Montana) is a "Distinct Population Segment of the species". But the Service also determined that based on its current conservation status and the nature of potential threats, the fisher does not warrant listing under the Endangered Species Act at this time (Federal Register: FWS-R6ES-2010-0017, June 30, 2011).

Influence of Roads and Trails

Fishers are not averse to crossing roads and snowmobile trails or using them as travel routes in winter, as long as they are associated with mature forest cover. Overall, research has found no consistent relationship between fisher habitat use and open road density—although the absence of obvious or statistically valid patterns may be simply a function of insufficient research effort to date. High-traffic roads that run along forested stream bottoms probably reduce the attractiveness of otherwise suitable sites for birthing and raising young but they do not seem to prohibit use of the areas for hunting and resting. Several authors recommend against construction of loop routes in riparian areas, since these tend to encourage human traffic in general and trappers in particular (see Heinmeyer and Jones 1994; Claar *et al.* 1999).

As is the case with lynx and wolverines, one of the primary threats that open roads pose to fishers comes from their role as snowmobile routes for trappers in winter. Fishers are curious and opportunistic, and they are prone to being caught in traps set for marten and other furbearers, as well as for themselves (Douglas and Strickland 1987). In some areas, this is a substantial source of mortality, especially where snowmobile routes pass through forested riparian bottoms, old-growth stands, and forested saddles (Heinmeyer and Jones 1994). Removal of large snags from the road corridor by firewood cutters is another indirect effect—although its import is related to the availability of such components elsewhere in the landscape. Fishers use cavities in dead trees for resting, concealment, and protection of young.

Area Use

Local Occurrence

Fishers have seldom been reported in the Divide landscape, and only one observation has been verified in the last 20 years [on Meyers Hill at the northern edge of the travel planning area in 1997 (HNF, MFWP wildlife observation files)]. Two probable observations (of tracks and an animal) have come from Ontario Creek toward the southern end of the Plan Area. Winter track surveys over the last 5 winters along the Continental Divide and in the Little Blackfoot watershed (Wild Things Unlimited) have detected no sign of fishers. Recent hair snag surveys targeting fishers across the HNF (Pilgrim 2007, 2008) found no evidence that fishers were present in the Divide landscape but did locate them on the Lincoln Ranger District just to the north. Fishers have been caught by trappers on the Lincoln District in recent years as well. Given these results, and the fact that Forest-wide surveys did not find fishers in either the Big Belt or Elkhorn Ranges just to the east, it appears that the Divide landscape may be the eastern extent of the fisher's geographical range (see also map from Maj and Garton 1993 cited in Heinemeyer and Jones 1994).

Local Habitat

In the Divide landscape, most suitable habitat—low/mid elevation mature and old-growth riparian forest—is present only in relatively small plots, with more marginal habitat available in larger blocks. This habitat is patchy in that it is separated, often by some distance, from other such tracts; but these sites are usually interconnected via forest habitat that, while unsuitable for long-term residence, provides an adequate travel environment.

The ongoing bark beetle epidemic across the Divide landscape is proving a double-edged sword for fishers—increasing snag and log density (both key habitat elements) while eliminating live forest canopy cover. Its impact, either way, will be limited since most habitat changes are occurring in drier upland pine forests, rather than in riparian sites. But where lodgepole or ponderosa pine lies adjacent to or intrudes into such riparian forests, there exists some potential for new combinations of fisher habitat components.

Black-backed Woodpecker

Biological Factors

Population Parameters and Habitat Relationships

The black-backed woodpecker (*Picoides arcticus*) is a primary cavity nester in coniferous forests. They excavate their own nest cavities in a variety of live or dead tree species and, as with many woodpeckers, play a key role in creating holes later used by other birds and mammals (secondary cavity nesters) (Dixon and Saab 2000). Englemann spruce, Douglas fir, lodgepole pine, ponderosa pine, and western larch are all used as nest trees. Black-backed woodpeckers forage almost exclusively on the larvae of bark beetles and wood-boring beetles that inhabit dying and newly-dead trees. Home range size varies from around 180 to 810 acres depending on habitat quality.

Black-backed woodpeckers are largely restricted to early post-fire forests (Hutto 1995), and while they can survive in other habitats in low numbers, they appear to require a regular recurrence of new burns for long-term survival (Kotliar *et al.* 2002). They arrive in burned-over forest within the first year following a fire and remain for up to 6 years—as long as the post-fire supply of wood-boring insects remain sufficient—but their local population usually peaks in 3-4 years (Hutto 1995). The woodpeckers are far more abundant in burned forests than in any other forest configuration. They are much less frequently observed in live mature forests, even those where snags are common.

For many decades in the 20th century, black-backed woodpecker populations were depressed by effective fire suppression, frequent salvage logging, and, to a lesser extent, by insect eradication (Hutto 1995). In the last few years, as crown fires have increased in size and intensity on the HNF and throughout the west in general (due to suppression-generated fuel build-ups), habitat opportunities for black-backed woodpeckers have been increasing.

Black-backed woodpeckers also occur in unburned landscapes where insect infestations, severe winter weather, or other phenomena have produced high densities of dead or dying trees with bark beetles and woodborer beetles. But, population density in these habitats is inevitably low—one possible explanation being that the largely black birds are less visible in fire-blackened snag aggregates (Dixon and Saab 2000, p. 2) and thus less vulnerable to predation than in other snag-rich habitats. Whatever the reason, recent research focused in Montana suggests that networks of recently burned forest—not just recently dead trees—are the key to long term survival of these birds (Hutto 1995).

Influence of Roads and Trails

The presence of open roads and motor trails has no direct effect on habitat use by black-backed woodpeckers. As with most woodpeckers, human presence does little to deter the birds from drilling for

insects, excavating cavities, or attending young in a nest (Hamann *et al.* 1999). They will, however, challenge intruders that approach a nest too closely (Dixon and Saab 2000, p. 15).

The primary impact of open roads is indirect: Dead trees are lost to firewood cutting or to Forest operations that remove hazard trees along the roads. Since most of this activity occurs soon after the death of the trees, when bark insects are present in large enough numbers to attract woodpeckers, it amounts to a reduction of local habitat—at least for some species. In the case of black-backed woodpeckers, such snag removal could have an effect on potential habitat opportunity in stands where most trees have been killed (and less so in stands with variable mixtures of dead and dying trees). In the end, however, black-backed woodpeckers seem interested almost enrirely in stands killed by fire and not those succumbing to bark beetles.

Area Use

Over the last 25 years, large stand-replacing fires have provided an abundance of suitable habitat for black-backed woodpeckers on the HNF. These include the Warm Springs (1988) and Boulder (2000) fires in the Elkhorn Range; the North Hills (1984), Cave Gulch (2000), Maudlow-Toston (2000), Jimtown (2003), Meriwether (2007), and Lakeside (2010) fires in the Big Belt Range; and the Monture (2000), Moose-Wasson (2003) and Snow-Talon (2003) fires in the Blackfoot landscape. These fires, as well as a number of smaller burns, have accounted for hundrerds of thousands of acres of burned forest in these three landscapes. Targeted post-fire surveys in the Cave Gulch and and Snow-Talon burns (2002-2006) found black-backed woodpeckers making widespread use of these areas. General surveys suggest the same result in the Warm Springs and Jimtown Burns as well (HRD wildlife files).

The Divide landscape has not experienced fires of this magnitude since the early 20th century, and thus has not provided viable habitat for resident black-backed woodpecker populations. The 2009 MacDonald Pass fire (170 acres) is the only recent "large" fire that is providing some habitat. Recent wildlife surveys (spring-summer 2010) identified black-backed and northern three-toed woodpeckers, among others, in the burn about half a year after the fire (HNF wildlife observation files). The current bark beetle outbreak is rapidly expanding habitat opportunities for a number of the more versatile woodpeckers, such as hairy and downy woodpeckers, red-naped sapsuckers, northern flickers, and even pileated and northern three-toed woodpeckers. But, the scarcity of burned forest is likely to limit the number of black-backed woodpeckers.

Western Boreal Toad

Biological Factors

Population Parameters and Habitat Relationships

The Western toad (*Bufo boreas*) is widely distributed in the Rocky Mountains and the Pacific Northwest. The Montana subspecies is the "boreal toad" (*Bufo boreas boreas*)—a name often applied to it in this area. Western toads are found most often in mountainous terrain—up to 9,220 ft. They are capable of breeding in shallower reaches of any clean standing water ranging from roadside ditches to lakes (Werner *et al.* 2004, p. 73-74). But, they generally prefer larger bodies of water than other local amphibians, such as spotted frogs and long-toed salamanders, which may breed in puddles and other small ephemeral pockets of water (G. Hokit, personal communication, 1995-1998). Eggs are laid in May or June (depending on elevation), and tadpoles and young toads are present in and around aquatic sites through the summer. Recent research in western Montana (Schmetterling and Young 2008) suggests that the toads may also make use of calm pockets of water in mountain streams for breeding.

Adults are largely terrestrial and, outside of breeding season, may wander considerable distances from their aquatic breeding sites. Females generally range farther from water than do males (Werner *et al.* 2004). Both juvenile and adult toads have been documented using small, fast-flowing streams as

movement corridors as well (Schmetterling and Young 2008). Western toads occupy a variety of terrestrial habitats from valley bottoms to high elevation slopes—including both forested and unforested sites. The quality of ground-level microhabitat is more important than large-scale vegetation structure. When not feeding, toads may seek cover in rodent burrows or under logs.

Western toads, once relatively common, have declined dramatically throughout Montana—and most of the West—over the last 25 years (Reichel 1996). Some decimating factors are local: draining and alteration of aquatic habitat, proliferation of cattle in breeding sites, pollution of aquatic habitat, introduction of predatory fish, fragmentation of upland habitats and travel routes. Others are probably continental or global—most prominently, the proliferation of lethal chytrid fungus. The most likely scenario is that the fungus is the primary source of mortality while local human-generated activities are acting as contributing factors (Bartelt *et al.* 2004).

Influence of Roads and Trails

Toads are small, relatively slow-moving animals that are often enough on the move (between breeding, foraging, and hibernating areas) that they are more at risk from roads and motor trails as barriers and agents of fragmentation than virtually any other species of interest on the HNF (see Maxell and Hokit 1999). Forest roads that seldom deter mammalian and bird species from moving about can be lethal barriers to toads. The roadways are exposed, environments that are difficult to cross. Western toads are one of the few species found dead in Forest roads and motor trails during the course of general wildlife surveys (G. Joslin, pers. comm.; personal observation). While the loss is not considerable in terms of total population numbers, it is high compared to other species, particularly where traffic volume is steady (see Fahrig *et al.* 1995), and it amounts to another cumulative impact on a population under stress.

Area Use

Western toads have been identified at a number of breeding sites across the Divide landscape. Biologists and students from Carroll College in Helena have conducted systematic surveys and tallied western toads at several locations in recent years (G. Hokit, pers. comm.). HNF wildlife surveys have found them as well—usually around aquatic breeding sites (Little Corral Gulch, Frohner Meadows, Blackfoot Meadows, MacDonald Creek, Dog Creek, Cellar Gulch) where use is concentrated. Occasionally they are observed in upland habitats, but their relatively low densities in these areas and their tendency to burrow under cover (in logs, under litter, in dense vegetation) make them difficult to discover. Population numbers are unknown, but we assume, given region-wide trends, that their numbers are lower than they have been historically.

Flammulated Owl

Biological Factors

Population Parameters and Habitat Relationships

The fammulated owl (*Otus flammeolus*) is a small insect-eating raptor with specialized habitat requirements. They are secondary cavity nesters in mature or old-growth ponderosa pine and Douglas-fir stands. Occasionally, they are found in mature aspen or cottonwood. They forage for large insects at twilight and after dark in open-grown forest formations with productive understories (tall grass, brush, young conifers) (McCallum 1994). This vegetation pattern is key to maintaining an adequate supply of insect prey while providing the owls with perches from which to forage and a substrate for large nesting cavities. Patches of denser trees or multi-storied vegetation within or near the open stands are important for roosting (Morgan 1994). Because of the nature of their food base, flammulated owls migrate south in the winter.

Flammulated owls are unevenly distributed—a function of the spotty dispersion of suitable habitat—and numbers now substantially lower than under historic conditions. Primary threats to flammulated owls are

habitat loss to logging and human settlement and the transformation of open-grown ponderosa pine stands into dense interior forest as a result of fire prevention (Morgan 1994). The scarcity of large open-grown ponderosa pine and Douglas-fir at mid-low elevation limits habitat opportunities throughout the Divide landscape, and as a result, the owls sometimes take advantage of less-traditional habitat formations: aspen stands or small patches of open-grown ponderosa pine adjacent to dense stands of Douglas-fir, for example.

Management strategy involves maintaining open-grown old-growth ponderosa pine and Douglas-fir forest at low and middle elevation with lightly grazed grasses and shrubs in the understory. The stands should contain a number of large snags with cavities similar to those that will support pileated woodpeckers and northern flickers (Bull *et al.* 1990). These conditions will not evolve naturally in the short term, and management needs to eliminate dense second-growth within these stands and burn away needle accumulations so that native grasses and shrubs can flourish and provide an environment for large insect prey (Morgan 1994). Retention of large trees, spaced fairly widely, should provide adequate perching and nesting sites for owls. Inclusions of denser tree growth is important for providing roosting habitat.

Influence of Roads

Flammulated owls are very tolerant of humans (McCallum 1994). Open roads appear to exert little direct influence on the owls and on their selection and use of habitat. As with most cavity dependent species, effects are indirect: Removal of large cavity-prone snags by firewood cutters and of roadside hazard trees by the HNF may reduce potential nesting opportunities. For flammulated owls, this is a concern in stands of certain composition and structure—namely, more open-grown forest environments with large trees at lower and mid elevations.

Area Use

The flammulated owl is classified as a sensitive species in Region 1 because of population viability concerns—some of which stem from obvious habitat problems and some of which are a function of insufficient field information. Information about population patterns is beginning to accumulate, primarily from research on the Bitterroot and Lolo National Forests, but also from recent wide-ranging survey work throughout Region-1 National Forests (see Climburg 2006; Smucker and Climburg 2008). Because of their diminutive size, reclusive daytime habits, and low population densities, flammulated owls are seldom seen and can normally be detected only through specialized survey methods. These efforts suggest that, in most areas, populations are small and fragmented (primarily because of the scarcity of suitable habitat).

Region-wide survey efforts, 2005-2008, have found that the HNF supports the highest flammulated owl densities of the 5 National Forests located east of or astride the Continental Divide—with overall densities more characteristic of the westside Forests (Lolo, Bitterroot, Nez Perce, Kootenai) (Climburg 2006; Smucker and Climburg 2008). The surveys found, however, that the most robust HNF populations were on the Lincoln Ranger District, west of the Divide.

In the Divide landscape, flammulated owls have been found east of the Divide along the Mt Helena ridge and near Unionville in relatively dry, mid elevation environments (4,900-5,100 ft) with a mix of ponderosa pine, Douglas-fir, and aspen, regularly interspersed with grassland. Both of these sites are outside the Divide travel planning area. Within the planning area, flammulated owls have been located at Priest Pass atop the Continental Divide. This site is at higher elevation (close to 6,000 ft) than the Mt Helena and Unionville sites and is dominated by large Douglas-fir. Ponderosa pine, lodgepole pine, and aspen are present but less common.

The current mountain pine beetle outbreak presents habitat opportunities for flammulated owls wherever it creates large ponderosa pine snags in open forest stands away from roads. The snags provide new cavity nesting substrate, and the selective loss of live overstory trees may open up forest canopies in

a manner that makes them more conducive for occupancy by the owls—allowing development of more vigorous ground vegetation and opening up understory flyways. Meanwhile, nearby Douglas-fir stands remain intact as a source of roosting habitat.

Management Indicator Species

Management indicator species (MIS) are intended to gauge the effects of Forest management practices on representative wildlife habitats. Indicator species have been designated to represent species groups whose habitats are most likely to be changed or affected by Forest management. In addition to those discussed in detail below—pileated woodpecker, hairy woodpecker, goshawk, marten—the *Forest Plan* also designates indicators for threatened and endangered species (grizzly bear, gray wolf, bald eagle, peregrine falcon—species listed at the time of *Forest Plan* release in 1986) and hunted species (elk, mule deer, and bighorn sheep). The status of species in these two groups is summarized in the following section, but they have been addressed in more detail in previous sections on *Big Game, Threatened and Endangered Species,* and *Sensitive Species.*

Pileated Woodpecker (Old-Growth DependentGroup)

Biological Considerations

Habitat Use and Population Status

The pileated woodpecker (*Dryocopus pileatus*) serves as an indicator of the health and availability of old-growth forests because of its need to nest in large diameter snags that occur most frequently in old-growth stands (Bull and Holthausen 1993). As well, it is often described as a "keystone species" because of the disproportionate effect it has on its environment, in spite of its inevitably low population density. Pileated woodpeckers create numerous large excavations in dead trees that are then used by a variety of secondary cavity dwellers; they enlarge cavities in living trees providing unique habitat for other species; they hasten the decay process in the live trees they excavate and in the logs they break apart while foraging (Bull and Jackson 1995). This "ecosystem engineering" alters the physical structure of the environment in ways that influence habitat opportunity for other species and general ecosystem processes (Aubry and Raley 2002).

In the Northern Rockies, pileated woodpeckers inhabit mixed conifer stands of various configurations, focusing on western larch and ponderosa pine as the key tree species. They also nest and feed in black cottonwood bottoms when they are available (McClelland and McClelland 1999; Hutto 1995). While pileated woodpeckers are most often found in mature and old forests, they frequently forage in immature forest stands with large residual trees, logs, and stumps left by previous disturbance (logging, burning) [see review in Bonar 2001, p. 3]. While the woodpeckers seem to prefer "closed" stands, Bull *et al.* (2007, p. 325-326) found that loss of considerable canopy closure due to high natural tree mortality did not appear to be detrimental to the birds as long as large dead or live trees and logs were abundant.

For nesting and roosting, pileated woodpeckers require large standing dead trees [typically >30 inches diameter breast height (dbh)]. They have a strong preference for ponderosa pine and western larch as nest trees. The availability of night-time roosting sites, provided most frequently by large hollow trees, has been hypothesized to be even more of a limiting factor than the presence of potential nest sites (Aubry and Raley 2002). Foraging sites are provided by standing trees (dead and alive) and by large logs and stumps, where the woodpeckers feed on a variety of wood-boring insects, preferably carpenter ants (Bull 1987; Bull *et al.* 1997). The pileated woodpecker is powerful enough to excavate deep foraging cavities in undecayed living conifers (Bull and Jackson 1995)—which opens up a wider range of feeding possibilities than is immediately available to other local woodpeckers.

Pileated woodpeckers are very mobile and are considered a large-patch-size species. Their home ranges are extensive and require a generous percentage of unlogged or partially logged forest with a reasonable

distribution of large trees. The average size of 27 home ranges (sometimes referred to as "territories") in good quality habitat in the Pacific Northwest has been calculated at 1,234 acres (just under 2 mi^2) (Bull and Holthausen 1993; Mellen *et al.* 1992). This translates to relatively low population density even in optimal habitat. Pileated woodpeckers have seldom been studied in more marginal habitats that characterize much of the east slope of the northern Rockies in Montana, but field observation suggests that population densities are appreciably lower in these environments. One study in Alberta found a strong correlation between habitat quality and territory/home range size: Pileated woodpeckers had much larger territories where potential foraging substrates and cavity trees were more sparse. The larger territories, however, did not result in reduced fitness: Productivity and survival were actually higher than those reported for prime habitat in the Pacific Northwest (Bonar 2001, p. 66).

Influence of Roads

New road construction imposes a direct effect on pileated woodpeckers in that it removes trees from long, narrow corridors of forest habitat (typically 12-20 ft wide) that the birds might otherwise put to use. To date, however, research has not documented any instances where habitat alteration in this configuration and on this scale has diluted the ability of an area to support resident pileated woodpeckers.

Most of the meaningful impact of roads is indirect: Large dead trees in the road corridor are consistently lost to firewood cutting or to Forest operations designed to remove hazard trees from along the roads. This represents an inevitable loss of key habitat components within open road corridors that are considerably broader than the roadbed itself (a zone out to 300 ft on each side of the road). This loss affects local pileated woodpecker habitat opportunity as well as that for numerous other dead tree associated species. Even with this expansion to a 600 ft wide swath, however, it is highly unlikely that the total area involved will be large enough to measurably alter local population viability.

Field research and prodigious observation have revealed that, as with the other woodpeckers reviewed in this report, human presence does little to alter the the birds' normal regimen of foraging, excavating cavities, roosting, and attending to young in a nest (Hamann *et al.* 1999). Possible exceptions are sites adjacent to open roads that support regular motor traffic and other human activity: While the woodpeckers are unlikely to discontinue foraging in these areas, they may avoid them as nesting and roosting sites. This behavior pattern has not been documented by research and, in any event, its significance as a limiting factor for pileated woodpecker populations appears dubious.

Area Use

Pileated woodpecker habitat has been modeled for the Forest based on the USFS Region 1 (R1) protocols identified above in the Methodologies and Assumptions Section. Based on this model, the Divide travel planning area supports approximately 59,264 acres of suitable habitat.

Roughly 147 miles of open road traverse this habitat, providing firewood cutters with opportunities for removing dead trees. If the maximum corridor available to snag removal is delineated at 300 ft on either side of the road, then approximately 10,691 acres (18.0 % of pileated woodpecker habitat) is vulnerable to snag loss. Actually, this is a substantial over-estimate, since in most cases, steep, irregular terrain and other habitat features make the firewood corridor narrower than 600 feet. As well, few snags in the corridor are large enough (in the 30 inch dbh range) to provide nesting or roosting sites for pileated woodpeckers; and as a result, only a minimal amount of this component would be lost. Many smaller trees on which the woodpeckers might feed, however, are likely to be removed.

Data on the occurrence of pileated woodpeckers in the Divide landscape has come from systematic surveys by the Northern Region Landbird Program, observations during general wildlife surveys since 1992, and reports from a variety of biologists and forest users. Pileated woodpeckers, while low in

numbers, are relatively easy to detect because of their large size, striking color pattern, loud distinctive calls, and highly visible and unique tree excavations.

Pileated woodpeckers in the Divide landscape are near the eastern reaches of their geographic range, and population densities are low (Hutto and Young 1999, p. 24). Suitable habitat is widely distributed but of lower quality than that found in Forests further west (in the Bitterroot, Lolo, and Flathead NFs). Habitats in the Divide landscape are drier; large trees less common; and 2 key habitat components—western larch and black cottonwood—are not present. The most robust pileated woodpecker populations on the Helena NF occur on the Lincoln RD, where habitat is more akin to that in the west-side Forests. Since the supply of big trees cannot be expanded in the short term in order to increase habitat opportunity, HNF management strategy has been to retain as many large diameter conifers as possible, regardless of the forest configurations in which they occur. This, coupled with management of enough mature forest to provide for the future supply of large trees, should ensure the stability of pileated woodpecker populations across the landscape—albeit at characteristically low densities.

Northern Goshawk (Old-Growth Dependent Group)

Biological Considerations

Habitat Use and Population Status

The northern goshawk (*Accipiter gentilis*) is the only large diurnal raptor adapted to interior forest environments in the northern Rockies. While some large forest owls (great horned, great gray) occasionally move about and hunt during daylight hours, these birds are primarily nocturnal. Key elements of goshawk habitat are extensive blocks of older forest with tight groups of mature nesting trees, abundant prey (squirrels, hares, larger songbirds, grouse), and mid-level flyways. In the northern Rockies, *optimal* habitat for goshawks is provided by old-growth Douglas-fir and ponderosa pine forest—and for that reason, the species was chosen as a management indicator for those habitats in the *Helena Forest Plan* (and in those of most other Region-1 Forests). Since the 1980s, copious field research and survey work have shown that goshawks are more versatile in their use of habitat than was believed when the Forest Plans were written. Goshawks have specific requirements for nesting and post-fledging habitat (closed-canopied mature forest) but otherwise have been shown to be forest generalists—and not particularly useful as Douglas-fir old-growth indicators (Braun *et al.* 1996; Reynolds *et al.* 1992; Clough 2000; McGrath *et al.* 2003).

Surveys over the past 15 years on the Helena, Beaverhead-Deerlodge, Lewis and Clark, and Medicine Bow National Forests have found that goshawks will nest and forage in stands of mature lodgepole pine as long as the basic structural attributes they need are in place and prey is adequate (Lemke 1993; Squires and Ruggiero 1996; Clough 2000). In the more fragmented forest environments east of the Continental Divide where mountains and plains intermingle, goshawks often occupy mosaics of forest and grassland or a mixture of different forest seral stages. They are drawn also to aspen stands because of the robust populations of potential prey these habitats support (grouse, cottontails, snowshoe hares, ground squirrels, mourning doves, flickers, small owls, and numerous large songbirds and woodpeckers). They are capable of foraging through open parks and woodlands and along forest edges. In certain circumstances, they do so on a regular basis (Younk and Bechard 1994). But regardless of the structural diversity of foraging habitatat and of goshawk ranges in general, nesting and post-fledging habitat inevitabily requires solid blocks of mature interior forest.

Extensive survey work over the past 15 years has demonstrated that goshawks are widespread across the Helena Forest. They maintain large home ranges (estimated at 5,820 acres per pair) (Reynolds *et al.* 1992; Clough 2000), and population densities are naturally low, even where suitable habitat is abundant. In areas with high prey populations and optimal habitat structure, home ranges may be smaller or overlap. The optimal size of a goshawk nesting stand is estimated to be about 15-30 acres; optimal post-fledging

areas (PFAs) are about 620 acres (and contain several potential nest stands). Nest stands and substantial portions of PFAs need to be densely forested with mature trees so as to provide effective nesting sites, suitable microclimate, abundant prey, and security from open-forest predators. The rest of the home range consists of foraging habitat and inclusions of unsuitable habitat. Foraging habitat, while predominantly mature forest, often includes a variety of tree densities and age classes and an array of forest openings (Reynolds *et al.* 1992). Goshawks can make use of such environments as long as prey is adequate.

Loss of habitat to clearcut logging and to stand-replacing fire are primary threats. Goshawks are sensitive to human disturbance of nest sites and can be very aggressive in defending the nest and the larger area within which newly fledged young are operating (post-fledging area) [personal observation, Helena and Beaverhead-Deerlodge National Forests 1987-2010]. They may occupy the same nest stand in consecutive years but rarely the same nest (although they may return to an old nest 2 or 3 years later). Just as often, they move to a new stand elsewhere in the home range. Because of their large home ranges and their natural tendency to cycle among different nest sites between years, they are able to adapt to many environmental changes (such as fire and timber harvest) by moving to adjacent undisturbed sites.

Influence of Roads

Construction of new Forest road into nest stands and post-fledging areas can make life difficult for resident goshawks by introducing regular human disturbance into sites that the birds are obligated to defend. As well, it can eliminate key habitat components (nest trees, perch sites, snags and logs used by prey species). Habitual human activity near an active nest may cause goshawks to abandon the site (Reynolds *et al.* 1992). But most often, while not abandoning the nest, goshawks will exert much more energy defending it (and defending the fledglings, once out of the nest) than they would under normal circumstances. This diversion of time and energy can negatively impact their ability to successfully raise and fledge young (Morrison *et al.* 2011). The presence of a road may also eliminate the stand as suitable nesting habitat in the future. Since high-quality nesting habitat is often a primary limiting factor for goshawks, new road systems that push into these areas can erode the overall habitat quality of a goshawk home range. Likewise, reopening closed roads or trails to motorized use can have a similar impact.

A recent analysis in the Lake Tahoe Basin of California suggests that goshawks avoid placing nests near roads, based on the intensity of traffic that they experience in a previous year (Morrison *et al.* 2011). Fieldwork on the HNF, however, has shown that goshawks will establish nests relatively close (within a few hundred feet) to existing roads (Sweeny Creek, Jimtown, Kelly Gulch, Cottonwood Gulch, Spring Gulch, South Fork Quartz Creek, Elliston Creek, Minnehaha Creek) or trails as long as most human activity predictably remains in the road or trail corridor. While foraging goshawks spend most of their time in mature forest environments, they frequently cross open roads and may use a road corridor as a convenient flyway when the forest presses in closely on either side and traffic is infrequent.

Area Use

In spite of the fact that goshawks maintain naturally low population densities (active nests on the HNF are typically 2-3 miles apart), they are fortuitously observed and reported on a regular basis across the Divide landscape each year. As well, the HNF has actively surveyed for goshawks each year since 1995. Because of the rarity of stand replacing-fire in recent decades, the Divide travel planning area has been dominated by mature forests that provide widespread opportunities for goshawk occupancy. The most recent HNF modeling effort (USDA 2009) estimates approximately 116,695 acres of goshawk foraging habitat and 1,920 acres of optimal nesting habitat in the planning area. The character of much of this habitat is changing as large numbers of lodgepole and ponderosa pine trees die and forest canopies open up as a result of ongoing bark beetle infestation. In the short term, this phenomenon is likely to improve goshawk foraging opportunity, but eventually it will measurably reduce the suitability of numerous nesting stands, as well as foraging habitat.

While survey efforts have not been complete enough to provide precise population estimates in any given year, they do suggest that virtually every potential goshawk home range in the Divide landscape (5,000 – 6,000 acres of predominantly forested habitat) is occupied sooner or later. At any given time, some ranges will be unoccupied because of the ongoing process of ranges being vacated through natural mortality and the mechanics involved with new birds locating and establishing new viable territories and home ranges.

Hairy Woodpecker (Snag-Dependent Species Group)

Biological Considerations

Habitat Use

The hairy woodpecker (*Picoides villosus*) is a management indicator for species dependent on snags. Snags provide the essential substrate for excavating cavity nests and the primary food source in the form of wood-boring and bark-dwelling insects. Hairy woodpeckers inhabit a wide spectrum of habitats ranging from open snag fields created by stand replacing fire to interior forests with a smattering of snags and other insect-prone trees (Hutto and Young 1999). Hairy woodpeckers are year-round residents in the northern Rockies and primary cavity nesters. The cavities that they excavate are eventually available to a myriad of other small birds and mammals.

The woodpeckers require dead or decaying trees at least 10 inches in diameter for nesting (Thomas *et al.* 1979), but they may forage on smaller trees. They feed on insects—wood borers, bark beetles, ants, and grubs—as well as on fruits, berries, and sometimes, seeds. These resources are gleaned from variety of substrates: dead and dying trees, live trees, logs, stumps, the ground—anything with a supply of appropriate insects or other suitable food.

The primary habitat component on which hairy woodpeckers depend is ephemeral—more so than key habitat features required by most non cavity-dependent species. While fire-killed trees may remain standing for up to several decades and continue to supply a potential base for nest cavities, their ability to support the insects on which the woodpeckers depend for food deteriorates quickly (typically, within 5-8 years). Trees killed by insects or disease may remain upright for only 2-3 years after becoming suitable for cavity excavation. As the supply of dead trees waxes and wanes in a given area, the hairy woodpecker population follows.

The woodpeckers reach their highest population densities in new burns and in stands beset with disease or insect irruptions (such as the current pine beetle outbreak), responding to the increased food source (Sousa 1997). In these cases, they may be the most common woodpecker present. As the abundance of wood-boring insects in a recently afflicted forested area begins to decline, the population density of hairy woodpeckers also drops and home ranges expand. Covert-Bratland *et al.* (2006) measured a sixfold decrease in population density and more than a tenfold increase in home range size between the 2nd and 9th year following a stand replacing fire in Arizona. Hairy woodpeckers are also capable of inhabiting healthy mature forests as long as a few snags or living trees with a ready supply of insects are scattered through the stand. Their population densities in these cases are relatively low, however. Given the range of habitats and food supplies that hairy woodpeckers are capable of exploiting, their population densities and their home range sizes can vary dramatically. Typical home ranges run from around 2.5 mi^2 to more than 37 mi^2 depending on habitat quality and food abundance.

Influence of Roads

As with the other woodpeckers reviewed in this report, hairy woodpeckers appear to suffer no meaningful effects from the presence of open roads and motor trails in their home ranges. Human presence, motorized or otherwise, does little to alter the the birds' normal habitat use patterns (Hamann *et al.* 1999).

Other indirect effects are more substantive: Virtually any accessible solid dead tree (pole-sized and up) in the road corridor (estimated at 300 ft on either side of the road) will inevitably be removed by firewood cutters or, less often, by HNF personnel as roadside hazard trees. This represents a loss of potential habitat components within open road corridors for hairy woodpeckers and other dead tree dependent species for which they serve as an indicator. Because hairy woodpeckers are mobile and range widely, loss of key components within road corridors may amount to little. The relative significance of the loss depends on the availability of snags in areas outside the road corridor. In current circumstances, the proliferation of beetle-killed pine trees across the landscape renders snag loss in the road corridor inconsequential.

Area Use

Hairy woodpeckers can be found with regularity in any forest habitat with a modicum of dead trees for nesting and enough insect-prone trees to provide feeding substrate (Hutto and Young 1999, p. 22). In the Divide landscape, hairy woodpeckers have been observed at similar frequencies in mature lodgepole pine, spruce/subalpine fir, Douglas-fir, ponderosa pine, mixed conifer, and aspen stands; in young forest and cutting units (including clearcuts) with residual snags and older trees; and in wetland and riparian shrub associations. They are very common in the MacDonald Pass burn—the only recently created post-fire environment of any size in the Divide landscape.

Hairy woodpecker habitat has been modeled for the HNF based on the USFS Region-1 (R-1) protocols identified above under *Methodologies and Assumptions*. The model employs a narrow definition of suitable hairy woodpecker habitat—focusing on certain densities of dead trees as would occur in older forest stands. Post-fire habitats, which would normally supply the best hairy woodpecker habitat, have been extremely rare in the Divide landscape in recent decades. So, the model falls back on older mature stands and old-growth stands as the next best habitat. But this habitat is also limited in the Divide landscape, because of intense timber harvest and large fires in the late 19th and early 20th centuries. The upshot is that the R-1 model identifies only 16,050 acres of habitat in the Divide travel planning area. Given the wide distribution of hairy woodpeckers across the Divide landscape, the 16,050 acres identified as suitable habitat by the R-1 model has to be considered a minimal estimate of *optimal nesting habitat*: The woodpeckers actually occur in forest habitats exceeding 100,000 acres in this landscape.

We have no population density estimates for hairy woodpeckers in the Divide travel planning area. But, extensive wildlife surveys by HNF biologists and numerous point-count surveys by the Northern Region Landbird Survey Program over the past 15 years indicate that the hairy woodpecker is common in the Divide landscape and on the HNF as a whole. It is a rare session in the field that does not produce hairy woodpecker observations. The Birds and Burns study (2002-2006) in the northern Elkhorn Range just east of the Divide landscape found that in healthy mature ponderosa pine dominated stands, the hairy woodpecker was the 17th most common of 44 bird species detected on regular point-count surveys (Russell and Saab 2004, 2005). The study also intensively investegated nesting patterns and productivity of cavity dependent birds and found that when conifer snags were uncommon in healthy forests, hairy woodpeckers—along with most other primary cavity nesters—found nesting opportunities in scattered aspen stands (Saab *et al.* 2007).

With the ongoing proliferation of beetle-killed pine trees over several hundred thousand acres across the HNF, nesting and foraging opportunities for hairy woodpeckers and other cavity dependent species are now increasing dramatically, and their populations can be expected to do likewise over the next few years.

American Marten (Mature Forest Dependent Species Group)

Biological Requirements

Habitat Use

While the *Helena Forest Plan* uses the American marten (*Martes americana*) as an indicator for the integrity of large blocks of mature forest cover in general, marten appear to be dependent primarily on a certain kind of mature forest—namely that with a relative abundance of large woody debris and an adequate distribution of standing snags. While marten will travel through forest habitats with "clean" understories, they need logs, stumps and snags for resting, denning, protection from the elements, and as habitat for prey. This is particularly important in winter, when marten live in a subnivean (under-snow) environment where woody debris provide needed structure and shelter (Thompson and Colgan 1994; Coffin *et al.* 2002, p. 7, 13-14). The upshot is that research now indicates marten are not an accurate management indicator for all mature forests.

Stumps and logs provide critical habitat components for foraging, resting, and denning (Spencer 1987; Coffin 1994), and marten dependence on mature forests in the Rockies seems to be linked to the availability of coarse woody debris that provides resting sites and thermal cover (Buskirk *et al.* 1989). Chapin *et al.* (1997) found that vertical and horizontal structure was more important than age or species composition.

Marten population densities and trends are difficult to evaluate: long-term data sets are rare, and populations often fluctuate dramatically over short periods of time, in large part because of variable trapping pressure. Where reasonably accurate data have been obtained, population densities have been very low compared to most other mammals—generally in the range of 0.4 to 2.4 marten per km² (Buskirk and Ruggeiro 1994, p. 14-15). Marten home ranges are large by mammalian standards, although they tend to be smaller in areas of high prey density (Buskirk and Ruggiero 1994, p. 27) and larger in areas of fragmented habitat (Coffin *et al.* 2002, p. 6). Recent studies in southwest Montana have calculated winter-spring home ranges of marten between 2.5 and 66.1 km², with female home ranges substantially smaller than those of males (Coffin *et al.* 2002, p. 6). Large home ranges, in this case, are a correlate of naturally low population densities (Buskirk and Ruggeiro 1994, p. 15, 28).

Fragmentation of coniferous cover by logging has reduced habitat suitability. Marten appear sensitive to patch size and usually avoid clearcuts because these areas don't provide functional subnivean zones or offer protection from predators—although they will cross (as quickly as possible) open areas up to 91 meters wide. Thompson (1994) concluded that higher marten densities in unlogged forests might be due to lower predation rates.

Influence of Roads

Marten do not like to cross broad open areas, and when they do, they move very quickly (C. Fager, pers. comm. 1991). However, they show little reluctance to cross Forest roads, groomed snowmobile trails, or paved highways (Coffin *et al.* 2002, p. 7). As with wolverines and fishers, marten are not averse to crossing roads and motor trails or using them as travel routes in winter as long as they are associated with a reasonable degree of mature forest cover. Overall, research has revealed no obvious relationship, positive or negative, between marten habitat use and open road density. High-traffic roads that run through mature forests with abundant deadfall may reduce the attractiveness of otherwise suitable sites for birthing and raising young but probably do not prohibit their use as hunting and resting areas.

As is the case with lynx, wolverines, and fishers, one of the primary threats that open roads pose to marten comes from their role as snowmobile routes used by trappers in winter. Marten are the most common target of trappers (Buskirk and Ruggiero 1994). Trapping intensity waxes and wanes with the trajectory of fur prices, and trapping mortality is periodically a more important determinant of marten population density than is habitat availability. Trapping can be a sunbstantial source of mortality where

snowmobile routes pass through riparian bottoms, old-growth stands, and other complex forested habitats (Buskirk and Ruggiero 1994).

Snag removal by firewood cutters working the road corridors represents a loss of habitat components important to marten. The abundance of standing and downed dead trees is one of the key factors allowing marten to occupy a forest stand.

Area Use

Marten are found throughout the Divide landscape wherever suitable habitat occurs—primarily in mid-high elevation forests with a strong component of subalpine fir, Engelmann spruce, and lodgepole pine with pockets of coarse woody debris. Marten are rare in lower elevation ponderosa pine and dry Douglas-fir forests (Buskirk and Ruggiero 1994, p. 22), although these habitats sometimes provide linkage between forests suitable for long-term occupancy.

Marten habitat has been modeled for the Helena Forest based on the Region-1 Protocols (identified above in the *Methodologies and Assumptions* Section). The model identifies some 145,655 acres of potential marten habitat in the travel planning area. In fact, much of this habitat consists of travel/linkage zones and somewhat marginal foraging habitat: Core habitat patches with in appropriate habitat types with sufficient numbers of snags and accumulations of woody debris account for much less of it.

The current pine beetle epidemic is changing potential habitat patterns for marten in the Divide landscape wherever lodgepole pine is a predominant component. On one hand, the bounty of large snags and logs is highly benficial to marten. On the other hand, the natural thinning, and in some cases, outright loss of the forest canopy as trees fall creates a less favorable environment for them. The proliferation of dead trees in ponderosa pine stands is of much less importance to marten since they seldom inhabit these relatively dry lower elevation forests.

Evidence for the presence of marten throughout the landscape has come from regular winter tracking surveys south of Highway 12 by MFWP, from more recent tracking surveys in the little Blackfoot watershed by Wild Things Unlimited (Gehman 2006-2010), and from observations during general wildlife surveys over the last 18 years (HNF wildlife observation files). These observations are insufficient to derive population parameters but they give a general picture of marten distribution and habitat use and show that marten population densities are low throughout much of the landscape. This is probably a function of a number of factors: past trapping; a relative abundance of naturally unsuitable habitat (dry ponderosa pine and Douglas-fir forest, dry grassland); a predominance of mature and pole-sized forest not yet old enough to provide prolific large woody debris (a function of historic fire patterns and past timber harvest); natural and human-induced fragmentation of optimal habitat sites; and inherently low population densities regardless of habitat conditions.

MFWP, relying on trapping data and snowcourse surveys, feels that marten population levels are sufficient to allow continued trapping in the Divide landscape (which is split by Trapping District 4, east of the Divide, and District 2 on the west side). There are no quotas set for marten in Montana, and trapping pressure is usually driven by fur prices. In Lewis-and-Clark and Powell counties, which cover the Divide landscape (along with portions of the Lewis-and-Clark and Beaverhead-Deerlodge NFs), trapping pressure in recent years has been relatively light and few marten have been caught. Since 1996, an average of 5.2 marten per year have been reported trapped in Powell County (range: 0-19 animals). None were reported from Lewis and Clark County. MFWP has recorded an average of three trappers taking marten in these areas since 1996.

The Montana Natural Heritage database provides relative estimates of marten distribution based on the number of observations reported in different latilong blocks across the state. For the Divide landscape, the database shows the highest number of observations in the greater Telegraph Creek drainage (15-20)

and lowest number in the lower Little Blackfoot/ Spotted Dog/ Elliston Creek area (1-7). The rest of the landscape has produced an average of 8-14 observations.

Elk, Mule Deer, Bighorn Sheep (Commonly Hunted Species)

The *Helena Forest Plan* designates elk, mule deer, and bighorn sheep as indicators of commonly hunted species populations—and by extension, of the habitats available to them on the National Forest. This designation is somewhat problematic for the HNF in that population density, structure, and distribution of these species are often less a function of available habitat on the National Forest than of State hunting regulations and local hunting pressure. This is equivalent to the situation with the marten, whose populations in some areas may be controlled more by trapping pressure than by habitat availability. An additional factor for bighorn sheep is the proclivity of robust populations in good habitat to succumb to disease carried by domestic sheep. In any case, maintenance of abundant suitable habitat is not enough by itself to govern the population size and composition of hunted species.

Elk and mule deer are present throughout the travel planning area and the surrounding region at population levels well above those needed to maintain viability. Multiple annual field surveys by MFWP attest to the fact that while local numbers fluctuate from year to year, overall populations of these species have been basically stable for several decades. HNF and MFWP habitat surveys indicate that the National Forest and surrounding lands are capable of supporting greater numbers of elk and mule deer than are normally present. Current population levels are set primarily by State hunting quotas designed to provide for public recreational hunting and to keep numbers low enough to limit game damage on private lands, while maintaining biologically healthy populations. In recent decades, debate about elk and mule deer has had little to do with population viability: It has focused primarily on the size and composition of the population surplus available to hunters and the degree to which agricultural and other private resources need to be protected from local population pulses. This is true in the Divide landscape as well as on the HNF as a whole.

Bighorn sheep were extirpated from most of the HNF in the late 19th and early 20th centuries by subsistence hunting and disease brought into the country with domestic sheep. Bighorns have been reintroduced to parts of the Forest and adjacent public lands in recent years—in particular, the northern Big Belt range and the central Elkhorn range. Populations have waxed and waned in these areas, largely in response to disease outbreaks. Habitat in both areas appears capable of sustaining viable local populations, as long as some separation between wild and domestic sheep can be maintained. Historic documents and occasional discovery of crumbling skulls in the field attest to the former presence of bighorn sheep in the Divide landscape (apparently more than 100 years ago). But with rare (and temporary) exception, no sheep have migrated into this area from adjacent regions (the Elkhorns, the Blackfoot/north Divide) in recent times. Key habitat, while fragmented, is available in several locations across the Divide landscape. In addition, the demise of domestic sheep allotments on this part of the National Forest in recent years has removed a primary decimating factor for bighorn sheep. Nonetheless, MFWP has no plans to artificially re-introduce bighorns to the area, and neighboring wild populations (at least at current levels) are not sufficiently robust to push natural migrants in this direction.

Wildlife, Environmental Consequences

This chapter discloses the environmental consequences of going forward with the No Action or any of the action alternatives in terms of expected effects on the wildlife resource. A tabular summary of these anticipated consequences (or “effects”) is provided in Appendix C.

Viability Determination

None of the four alternatives would negatively affect the population viability of any of the species analyzed in the main body of this report or those identified in the Wildlife Analysis Approach Table in Appendix C. The following assessment of threatened, endangered, sensitive, and management indicator species provides the rationale for the viability determinations.

Open Route Miles under Different Alternatives

The basic road and trail data summarized in Tables 3.53 and 3.54 underlie much of the ensuing assessment as to the relative effects of different alternatives on wildlife.

Table 3.53 Miles of Road and Trail open to wheeled vehicles in the Travel Plan Area

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
HNF Roads Open Yearlong	286	284	262	265
HNF Roads Open Seasonally	27	27	10	16
County roads within HNF Boundaries	19	19	19	19
Private Roads within HNF Boundaries	99	99	99	99
HNF Authorized Motor Trails	19	28	0	4
Non-System Motor Trails/ 4wd Tracks	16	0	0	0
Total Open Roads	**431**	**429**	**390**	**399**
Total Open Motor Trails	**35**	**28**	**0**	**4**
Total Open Motor Routes	**466**	**457**	**390**	**403**

Table 3.54 Miles of Snowmobile Trail in the Travel Plan Area

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
HNF Roads *Specifically Designated* for Snowmobile Use by the Travel Plan	69	139	164	153
HNF Motor Trails *Specifically Designated* for snowmobile Use in the Travel Plan	19	26	0	4
Other HNF and County roads on which Snowmobiles are *Allowed* by the Travel Plan	239	223	218	217
User-made Routes on which Snowmobiles are *Allowed*	21	5	5	5
Total Snowmobile Routes that are Regularly Used and Approved under the Travel Plan	**348**	**393**	**387**	**379**
Regularly-Used Snowmobile Routes on (or adjacent to) Roads that the Travel Plan identifies as “Closed to Motorized Vehicles Yearlong”	77	16	20	19
Grand Total of Roads and Trails that Regularly Serve as Snowmobile Routes	**425**	**409**	**407**	**398**

It should be noted that some of the mileages shown in Table 3.53 vary slightly from those presented in Chapter 2 of the *EIS.* In particular, "Non-System Motor Trails/ 4wd Tracks" in Alternative 1 have either been eliminated or converted to designated as Helena NF System routes in Alternatives 2, 3, and 4. In Table 3.55, the converted routes have been added to the appropriate System categories. In the *EIS,* however, these routes continue to be shown as "non-system" roads and trails in all four alternatives (so as to facilitate tracking their fate).

In Table 3.54, mileages in the first row, "HNF Roads Specifically Designated for snowmobile Use by the Travel Plan", are identical to those in Chapter 2 of the *EIS.* The remaining categories, however, were tallied specifically for this analysis (particularly for the lynx analysis)—using the map of *Snowmobile Routes on the Helena National Forest* (Helena Snow Drifters 2003), the *Helena National Forest Visitor Map,* USGS quad maps, information in the HNF recreation files, and field observations by HNF recreation personnel and members of the Helena Snowdrifters Snowmobile Club.

Mitigation Common to All Alternatives

The following mitigation is common to all alternatives:

- All road closures would have yearlong or seasonal designations that accurately reflect the needs of the local wildlife species upon which the restrictions are based.
- Firewood retrieval would be addressed via the firewood permit process.
- Road closure effectiveness would be monitored annually and local adjustments to closure methods and enforcement made as necessary to protect wildlife resources.
- Effects from the 300-ft off-road camping rule would be monitored in areas where key habitat components for wildlife are at issue, and local restrictions would be applied in the future if necessary.

Wildlife Habitats and Habitat Components

General Habitat

Common Effects of Travel Management

Disturbance

Roads can lead to concentrations of human activity in wildlife habitat and affect the way animals use an area. Human activities impact wildlife and wildlife habitat through four primary means: exploitation (mortality), disturbance (displacement), habitat modification, and pollution (via chemicals or sediment). Wildlife behavior takes the form of avoidance, habituation, or attraction (Knight and Cole 1995). Some animals avoid roads and the risks associated with them, but as a result, have less habitat to work with across the landscape. Species that are attracted to roads or become habituated to them have a more extensive array of habitat choices open to them but may suffer higher rates of human-caused mortality as a consequence.

Human disturbances associated with roads and trails vary in intensity, duration, and reach, and thus produce different reactions among wildlife species. Motorized activities such as ATV travel and snowmobiling are of short duration, high intensity, and large geographic scope (50 miles or more per day). Non-motorized activities such as hiking, horseback riding, mountain biking, and cross-country skiing generally are of longer duration at any given site but of low intensity and small to moderate geographic scope (5-20 miles per day). Using motor vehicles to reach a non-motorized recreation area combines aspects of the two recreation categories. Such a mix is highly localized in geographic scope, of moderate

to high intensity, and long in duration. All of these things will have different effects upon various wildlife associations and habitats. Motorized and non-motorized human presence may cause wildlife species to abandon nests or dens, change movement patterns, and alter foraging behaviors (Knight and Cole 1995). While some species are quite tolerant of humans, a majority react negatively to one degree or another.

Since 1986, the Helena National Forest has closed many miles of roads to motorized use. However, the remaining open roads still present impacts to wildlife species sensitive to the disturbance associated with human activity. Road density standards have been developed through research and are recommended for many species. These analyses are used where appropriate and are discussed below under the respective species. In many cases the traffic levels along Forest roads are consistently minimal, in other cases substantial, and in others periodic (sparse during the week, higher on weekends; low in summer, high in hunting season). As a result, most analyses use weighted road densities to account for varying levels of public use: Typically, primary arterial and collector roads are given the most weight, local and primitive roads less, and closed and private roads very little, if any. This approach emphasizes the fact that the primary influence of most Forest roads on wildlife stems not so much from their physical impact on habitat as from the degree to which they funnel human activity into the landscape.

Habitat Loss

Construction of new roads creates a direct loss of habitat. In many cases, this represents a permanent loss of natural substrate and native vegetation if the road surface is formidable enough (graded gravel roads). Smaller animals are vulnerable to this local loss of habitat, particularly in interior forest environments.

Since none of the Divide travel plan alternatives proposes new road construction, direct habitat loss would not be a factor in this case. Different alternatives, however, would close different combinations of road and motor trail—thus allowing for different levels of route surface slowly reverting to more natural habitat formations. This would happen more quickly on primitive dirt roads—particularly those that are eventually reconditioned or recontoured. It would be a much slower process on harder-surfaced Capital Investment roads—some of which may be retained as gated routes for administrative use (fire protection, weed spraying, silvicultural improvements, and so on).

Fragmentation

Fragmentation has two components: Reduction of total available habitat and apportionment of remaining habitat into smaller, more isolated patches (Meffe and Carroll 1994). Roads generally have less fragmentation effect on species with large home ranges and great mobility (mountain lions, elk, goshawks). Species with small home ranges and limited mobility (deer mice, ground squirrels, muskrats, pocket gophers, toads) generally are more susceptible to the barriers and subsequent fragmentation created by roads (Meffe and Carroll 1994).

As discussed earlier, the main mechnaism by which most Forest roads “fragment” habitat in the Divide landscape is by serving as conduits for human activity—as expedited by motor vehicles. Because many species are wary of vehicle corridors, the roads tend to repel regular use by these species, confining the bulk of their activity to non-motorized islands. This is fragmentation of wildlife *use* more than it is than of *habitat*, and the degree to which it acts on local wildlife populations depends upon the level of vehicle traffic on various roads at different times of year, as well as the sensitivity of the species to it.

For smaller animals of limited mobility, the dirt/gravel roads themselves may serve to alter local habitat use patterns, but they seldom prevent animals from crossing back and forth on a regular basis—although such crossings are sometimes lethal. To one degree or another, habitat opportunities are diminished.

Edge Effects

Linear strips of forest/grassland edge are features of National Forest road corridors that benefit some wildlife species and create problems for others (Forman *et al.* 2003). Road edges increase soil erosion and decrease soil moisture; they are zones where human activity is more likely; and they allow for elevated levels of noise, evapotranspiration, temperature, incident solar radiation, and exotic species introductions, (Trombulak and Frissell 2000; Forman *et al.* 2003). On the other hand, some species benefit from the additional habitat created by road corridors (Forman *et al.* 2003). For example, raptors (kestrels, Swainson's hawks, harriers, rough-legged hawks, and so on) sometimes use roadsides more than adjacent habitat because of greater availability of perch sites coupled with better viewing and the presence of roadside prey.

The effects of edge on the adjacent forest depend on how much of the original canopy and understory remains. Edge zones tend to be drier and less shady than interior forests, and they often favor shade-intolerant plants (Trombulak and Frissell 2000). As a result, interior forest wildlife species are negatively impacted (Reed *et al*. 1996). Road edge habitat is different from natural edges or those created by clearcuts: non-road edges become less distinct over time while road edges tend to remain relatively sharp over the long-term (Reed *et al.* 1996).

Since edge effects occur, to one degree or another, along all road corridors, regardless of whether the roads are open or closed, the affected area is the same for all four alternatives: 470 – 476 miles of Forest and County roads (the variation arising from conversion of "road" to "trail" in different alternatives). This is a very rough index of potential effects, since some roads exhibit little contrasting edge—such as narrow, closed-in forested roads or those passing through grassland. Also, some effectively-closed forest roads that receive no motorized use would gradually lose edge contrast as conifers colonize the roadbeds. While some of the wider motor trails may also generate edge effects, trail mileage is not included in the above summary.

Alternative 1, No Action

Direct Effects

There would be no direct effects on forested habitat or old growth habitat since no new road or trail construction is a part of this Alternative.

Indirect Effects

Indirect effects on general forested habitat and old growth would continue to be generated by human activity along 424 miles of existing open roads and motor trails. This activity would wax and wane periodically due to factors unrealated to travel planing.

Alternative 2

Direct Effects

Alternative 2 would generate no new direct effects on grassland or forest habitat (including old-growth) since no new road or trail routes would be constructed. This alternative would retain 9 fewer miles of open road and motor trail than the current system—affording the potential for return of some of these corridors to more natural condition.

Indirect Effects

Indirect effects on forest and grassland habitat would continue to be generated by human activity along 457 miles of open roads and motor trails. Disturbance levels would decrease in some areas and increase in others. Motorized activity would vary in time and place due to factors unrelated to travel planing. Changes in motorized disturbance from the existing condition would be insufficient to generate measurable differences in survivorship and viability of wildlife populations. However, differences in local

disturbance levels would be noticable at several sites in the form of shifts in wildlife behavior and local habitat use patterns.

Alternative 3

Direct Effects

Alternative 3 would not add to direct effects on forest or grassland habitat since no new road or trail routes would be constructed. This alternative retains 68 fewer miles of open road and motor trail than the current system—affording the opportunity for some of these corridors to return to more natural condition.

Indirect Effects

Indirect effects on forest and grassland habitat generated by human activity would continue along 390 miles of existing roads. Redistribution of motorized disturbance to new areas would be minimal under Alternative 3. Decrease in motorized disturbance from the existing condition, though substantial, would be insufficient to generate measurable improvement in survivorship and viability of wildlife populations. However, decrease in local disturbance levels would be noticable at several sites as shifts in wildlife behavior and local habitat use patterns.

Alternative 4

Direct Effects

Alternative 4 would not add to direct effects on forest or grassland habitat since no new road or trail routes would be constructed. This alternative retains 52 fewer miles of open road and motor trail than the current system but 13 miles more than Alternative 3. Still, this affords the opportunity for several route corridors to return to more natural condition.

Indirect Effects

Indirect effects on forest and grassland habitat would continue to come from human activity along 398 miles of existing roads. Redistribution of motorized disturbance to new areas would be less than under Alternatives 1 and 2, but somewhat greater than Alterntive 3. Decrease in motorized disturbance from the existing condition, though substantial, would be insufficient to generate measurable improvement in survivorship and viability of wildlife populations. However, decrease in local disturbance levels would be noticable at several sites as shifts in wildlife behavior and local habitat use patterns.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies past, present, and reasonably foreseeable projects and activities, in addition to proposed Travel Management, that may affect general forest, old-growth, and grassland habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM).

Forest Service Past and Ongoing Activities

Several past and ongoing activities on the National Forest add to the direct effect of the road system on forested and grassland habitats. These include activities that remove or alter wildlife habitat such as timber sales, prescribed burning, salvage harvest of dead trees, small mining operations, noxious weed spraying, and cattle grazing. A number of projects designed to deal with the ongoing bark beetle epidemic are underway—some already completed. These include the Cromwell Dixon campground, Park Lake campground, Kading campground, Moose Creek picnic area, MacDonald Pass Ski Trails, and Forest-wide Roadside Hazard Tree Removal projects. Also nearing completion is the Clancy-Unionville vegetation project—an extensive operation originally designed to thin mature green forest, but now primarily a dead-tree harvest. In addition, the MacDonald Pass carbaryl spraying project is designed to fend off additional

beetle kill at developed recreation sites. Road access to upper Tenmile Creek is currently blocked by an Environmental Protection Agency (EPA) operation to deal with toxic mine wastes adjacent to the town of Rimini.

Adjacent Private and Other, Past and Ongoing Actions

Private land development affects forest and grassland habitat. Vegetation management on private lands, particularly ongoing harvest of beetle-killed trees, can increase fragmentation and edge effects and cause direct loss of habitat in the long-term. Other projects include expansion of developed recreation facilities (Great Divide ski area), reworking the Marysville road, expansion of mining operations (Montana Tunnels, Drumlummon Mine, Bald Butte reclamation), roadside tree cutting along Highway 12, and reconstructing the Marysville Road.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities that may directly affect forest and grassland habitat include revision of management plans for several grazing allotments, more projects designed to deal with the aftermath of the mountain pine beetle epidemic; timber harvest projects (the Telegraph and Red Mountain Flume vegetation projects); post and pole harvest; ongoing firewood cutting; rerouting of some sections of the Continental Divide trail; and the Rimini Road improvement project. These activities may positively or negatively affect forest or grassland vegetion structure (including fragmentation and edge effect)—some substantially, others to a minor degree.

Adjacent Private and Other, Reasonably Foreseeable Actions

Numerous small developments and activities occurring in the foreseeable future would continue to affect forest and grassland habitats. In particular, development of private land would continue to convert wildlife habitat to non-habitat, increase edge effects, and fragment habitat. Additional removal of beetle-killed trees would continue to modify habitat adjacent to the Forest.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Disturbance

Alternative 1 would retain potential for motorized disturbance of wildlife along 466 miles of roads and trails. Alternative 2 would decrease motorized disturbance in some areas and increase it in others, but overall would reduce the motor route system to 457 miles. Under Alternative 3, redistribution of motorized disturbance to new areas would be minimal, and the system would decrease to 390 miles. Alternative 4 would be similar to Alternative 3 but with 403 miles of open routes. Differences in motorized disturbance among alternatives would be insufficient to generate measurable differences in survivorship and viability of wildlife populations. Differences in wildlife habitat use patterns would be noticable in local areas: Alternatives 1 and 2 would generate the most local disturbance, Alternatives 3 the least.

Habitat Loss

There would be no new road building and, thus, no new habitat lost under any of the four alternatives.

Edge Effects

Because, in the short term, edge would remain the same along both open and closed roads, there would be no differences in edge effects among the four alternatives. Over the long term, edge would become less distinct along many closed roads as surrounding vegetation moves into the road corridors. Area-wide implications for wildlife are minor.

Forest Plan Consistency

All alternatives would comply with the *Helena Forest Plan* and with other appropriate legal mandates with regard to direct and indirect effects of roads and motor trails on forest and grassland habitat.

Riparian Habitats

Common Effects of Travel Management

Riparian zones occupy relatively small areas, but they incur a disproportionate amount of human activity (Hutto and Young 1999; Thomas 1979). Roads in riparian zones reduce habitat effectiveness for many wildlife species mainly through vegetation alteration and disturbance associated with human presence (USDA 1996a). Many riparian zones are paralleled by roads and many host dispersed camping sites. While this may enhance the opportunity for the human-wildlife experience, it decreases the habitat effectiveness of the riparian area for many species. Recreation and firewood retrieval are the main activities facilitated by roads in and adjacent to riparian areas (see also *Snags and Woody Debris)*.

The Divide travel planning area currently supports roughly 93 miles of roads and motorized trails within Riparian Habitat Conservation Areas (RHCAs), 83 miles of which are open to motorized use. Table 3.55 summarizes mileage of motorized routes in RHCAs under each of the alternatives. Total open road miles are shown for comparison. Since in many of these areas, recreationists are allowed to drive up to 300 ft off the road to camp, the zone of influence associated with these routes can be substantial.

Table 3.55 Miles of roads and trails in Riparian Habitat Conservation Areas (RHCAs)

Alternative	Miles of Open Motorized Routes in the Travel Plan Area	Miles of All Routes (Open and Closed) in RHCAs	Miles of Open Motorized Routes in RHCAs
Alternative 1	466	93	83
Alternative 2	457	93	76
Alternative 3	390	93	69
Alternative 4	403	93	70

Alternative 1, No Action

Current direction for off-road use in riparian areas is based on the Off-HighwayVehicle EIS (2001). This allows for motorized travel up to 300 feet off designated routes to reach dispersed campsites. Under Alternative 1, current levels of vegetation alteration and disturbance associated with dispersed camping would continue. The potential for widespread degradation is unlikely under this alternative because the off-route use is restricted to dispersed camping. Vehicles are not permitted in the off-route corridor for activities other than camping (firewood cutting, picnicking, game retrieval, off-route recreational riding, and so on). Periodic diplacement of wildlife and localized degradation of habitat components (vegetation, woody debris) would continue at current levels. Impacts may be largely eliminated by suspension of the "300 ft rule" in certain sensitive riparian areas where off-road vehicle is likely to cause environmental damage.

Alternative 2

Alternative 2 would reduce the reach of roads and motor trails in Riparian Habitat conservation Areas by 7 miles. This would result in a proportional decline in the impacts summarized above.

Alternative 3

Alternative 3 would reduce roads and motor trails in Riparian Habitat Conservation Areas by 14 miles—the most of any alternative. This would result in a consequent decline in the impacts summarized above.

Alternative 4

Alternative 4 would reduce roads and motor trails in Riparian Habitat Conservation Areas by 13 miles compared to current conditions—not quite as much as the reduction under Alternative 3. Still, this would measurably reduce local impacts in riparian sites.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect riparian habitats. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM).

Forest Service Past and Ongoing Activities

Several recent and ongoing activities on the National Forest have implications for riparian habitat—some of which have positive effects. These include revision of grazing allotment permits that incorporate riparian fencing and other means of limiting cattle access to productive wet habitats (MacDonald Pass, Empire, Clancy); mine reclamation designed to limit seepage of toxic waste into steams and riparian sites (Charter Oak, Frohner, Rimini); implementation of the HNF Weed EIS, which will improve the functioning of vegetation associations in some in some riparian sites; relocation of heavily-used recreational trails upslope out of riparian bottoms; and closure of roads that have degraded riparian habitts. Other activities may reduce riparian habitat effectiveness. These include scattered small mining operations (under the 1872 Mining Act), cattle grazing in riparian sites on many allotments, and retention of roads in riparian areas that slowly slough sediment into streams. A number of recently completed and ongoing vegetation projects have some potential to increase stream sedimentation, and thus affect the quality of the riparian environment—although most of potential impacts have been reduced, eliminated, or mitigated via the standard project NEPA process. Projects include the Clancy-Unionville vegetation project; the MacDonald Pass CDNST trailhead, Kading campground, Park Lake campground, Moose Creek picnic area, MacDonald Pass Ski Trails and Cromwell Dixon campground hazard tree removal projects; and the Forest-wide roadside hazard tree removal project.

Adjacent Private and Other, Past and Ongoing Actions

Private land development continues to impact productive wet sites in some riparian areas. This is occurring near the Forest boundary on both sides of the Divide, as well as on private inholdings within the Forest. Timber harvest on private, State, BLM, and Helena City lands may also have implications for wildlife habitat in riparian areas—some positive, some negative. Mining operations near the Forest have compromised the integrity of riparian function in the past, and continue to do so in some areas. The recently completed Marysville Road project has influenced, if only marginally, the functioning of a drainage originating on the National Forest—though long-term effects are likely to be positive (reduction of sediment).

Forest Service Reasonably Foreseeable Actions

Foreseeable activities that may affect riparian habitats to one degree or another include the upgrading of the Rimini Road, which closely parallels Tenmile Creek, and reauthorization of grazing in some of the Divide allotments, which inevitably involves riparian area monitoring and improvement of problem sites. Larger vegetation projects likely to influence some riparian areas include the Red Mountain Flume-Chessman Reservoir vegetation and the Telegraph and Tenmile vegetation projects.

Adjacent Private and Other, Reasonably Foreseeable Actions

Activity on non-Forest land within the cumulative effects area that is expected to continue in the near future and that may add to the effects of Travel Management on riparian areas includes: settlement and development of private lands (including road building) that encompass riparian sites; timber harvest and removal of beetle-killed trees in and adjacent to riparian areas; continued mining operations (in particular, the Montana Tunnels mine expansion) that alter stream courses and add to stream sedimentation; continued ATV and other motorized activity in riparian areas on private, BLM, and State lands; continued livestock grazing on adjacent private and BLM lands; continued diversion and impoundment of streams flowing off the National Forest for agricultural purposes and, in the case of Tenmile Creek, for municipal water supply.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Alternative 1 would retain the current 83 miles of open roads and motor trails in Riparian habitat conservtion Areas (RHCAs). Alternative 2 would close roads/ motor trails in some RHCAs and allow new motorized use in others—reducing overall presence to 76 miles. Alternative 3 would not introduce any new motorized use into currently restricted RHCAs and would reduce overall road/ motor trail presence to 69 miles in these habitats. Alternative 4 would close nearly as many roads/ motor trails in RHCAs as Alternative 3, but would sanction ongoing unauthorized use at 2 sites (Spotted Dog Creek, Bison/ Ontario Creeks)—a total distance of approximately 1 mile.

In most cases, direct impact on riparian wildlife habitats from use of these roads and trails would be minor (from erosion and sedimentation). Most effects would be indirect: disturbance of wildlife in these focal habitats and soil/vegetation damage from off-route riding. These effects would be local and would not be measurable in terms of area-wide population viability.

Forest Plan Consistency

All four alternatives would comply with *Helena Forest Plan* direction as to the effects of roads on riparian and wetland wildlife habitat—primarily with regard to summer elk habitat in the Montana Elk-Logging Study (*HFP,* Appendix C).

Connectivity and Fragmentation

Connectivity is important because it allows animals to move between habitats to meet daily and lifetime needs (Forman *et al.* 2003). It also allows repopulation of unoccupied areas. Restricted movement results in habitats where some species are absent, others are present in numbers well below carrying capacity, and diversity is depressed. This increases the risk of local extinction, resulting in lower regional population and lower long-term population persistence. This also can increase isolation and result in decreased gene flow (Forman *et al.* 2003; Noss *et al.* 1996).

Roads vary widely in their role as agents of fragmentation. Some highways act as true barriers for large numbers of species, substantially altering the way animals are able to move through the landscape. Many Forest roads, on the other hand, are so nondescript and little used that they exert virtually no influence at all on wildlife movement patterns.

Roads are not necessarily a negative factor. Some species are attracted to roads (Knight and Kawashima 1993; Knight *et al.* 1995). Ravens are more abundant along roadsides than elsewhere because of food produced by road-kills. Many bird species do not perceive roads as any more of a deterrent to normal activity than natual features of the landscape (St. Clair 2003). Lynx cross roads at frequencies that do not differ from random expectations (Ruggerio *et al.* 2000). Elk and deer are often drawn to the forage opportunities afforded by roadside vegetation, especially in spring. Carnivores, such as wolves, bears,

coyotes, and bobcats, among others, frequently use roads with low levels of human activity as travelways—often at night, but sometimes during daylight hours. This use may be even greater in winter when some roads become hard-packed snowmobile routes.

Common Effects of Travel Management

In the following assessment, effects on connectivity are described in terms of the ability of the landscape to provide dispersal, migration, and travel opportunities between suitable habitat patches. The focus is on regional dispersal of large and mid-sized mammals through the Continental Divide linkage zone, but the assessment is also applicable to more localized movement zones. It is assumed that the primary human-generated complication for these landscape functions is the density and dispersion of *open* roads (and in some cases, motorized trails), and we use this as the basis for two indices to compare alternatives: (1) open road density and (2) large non-motorized habitat patches.

Paved Roads and Highways

Most of the field studies and literature reviews that have found roads to be "barriers" impeding wildlife movement and "fragmenting" habitat have dealt with paved roads and highways that carry a recurrent flow of fast-moving traffic. These roads are hard-surfaced, wide, elevated, and often flanked with cleared corridors, fences, and other impediments. They can be formidable hostile environments, especially for small mammals, amphibians, reptiles, and low-flying birds (Mader 1984; Swihart and Slade 1984). Traffic speed and volume on some of these highways make crossing them a challenge for humans, to say nothing of foxes, bears, rabbits, squirrels, grouse, owls, and other animals not entirely aware of the hazard they face. Some larger animals may avoid crossing paved roads and consequently extend and convolute their movement patterns to compensate (Trombulak and Frissell 2000). For some species, the mere presence of a highway acts as a barrier. For others, the width of the road, associated clearing, and the presence of roadside barriers (typically fences) may be the deciding factors (Oxley, *et al*. 1974).

The only paved highway in the travel planning area is U.S. Highway 12, a well-traveled 4-lane throughfare that runs through HNF lands for about five miles on its way over MacDonald Pass—an area where numerous wildlife species, large and small, are killed by vehicles each year. The Highway also runs close enough to the National Forest for another 16-17 miles on both sides of the pass that it influences animals crossing from one part of the National Forest to another in those areas. None of the travel plan alternatives propose any changes that directly or indirectly alter the impact of Highway 12.

Forest Roads

With the exception of the Orofino Gulch and Marysville Roads, all Forest/County roads in or near the travel planning area are unpaved routes that range from regularly graded, well-traveled gravel roads to rough, narrow 4-wheel-drive (4wd) tracks that may see a vehicle pass only once every week or two. Most Forest roads fall somewhere in between these extremes. The implications of this type of road system for wildlife have been discussed earlier in this report; but, in essence, these routes do not physically impede movement by most animals. Rather, they serve as conduits for human activity that cause some species to avoid the road corridors or to seek out alternate travelways, generally complicating their ability to move through the landscape in an efficient manner. Crossing these roads can be lethal in that it puts big game animals at risk from hunters in the fall and certain carnivores at risk from general shooting any time of the year. The roads also provide access for trappers on snowmobiles in the winter.

Regularly traveled routes, such as the Sweeny Creek, Rimini, and Little Blackfoot River roads, are more formidable barriers to movement than are the narrow, lightly traveled roads characteristic of much of the planning area. Vehicle speeds may be high enough on some sections of these roads that animals are hit and killed. To account for this disparity in potential impact, the summary below weights road density in the travel planning area by road status (dimensions, condition, traffic level) in order to more accurately gauge potential effects.

Table 3.56 compares weighted open road density in the travel planning area under each alternative. It includes all roads open to wheeled vehicles at any time of the year. Primary *Arterial* and *Collector* roads are tallied at 100% of length; more primitive *local* roads, which receive little vehicle use, are tallied at 25% of length; private roads not open to public use are also tallied at 25% of length [see USDA 2007e;] [6]. While Alternatives 2, 3, and 4 would reduce open road density in the travel planning area, the differences between alternatives are not striking.

Table 3.56 Weighted open road density in the Travel Plan Area under the 4 alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
North of Highway 12	0.79 mi/mi²	0.76 mi/mi²	0.75 mi/mi²	0.73 mi/mi²
South of Highway 12	0.87 mi/mi²	0.86 mi/mi²	0.77 mi/mi²	0.81 mi/mi²
Total Travel Plan Area	0.84 mi/mi²	0.83 mi/mi²	0.76 mi/mi²	0.78 mi/mi²

Table 3.57, below, summarizes the occurrence of non-motorized habitat patches larger than 1,500 acres throughout the Plan Area. These habitat blocks provide sanctuaries in which animals wary of road activity should be able to operate with minimal disturbance from humans. All things being equal, fewer, larger patches translate to better habitat integrity and connectivity for these animals.

Table 3.57 Habitat patches larger than 1,500 acres that are off-limits to wheeled motorized vehicles yearlong under four alternatives. Patches are measured from the edge of open road/ motor trail corridors without benefit of buffer zones. Patch sizes are rounded to the nearest 5 acres.

Area Identification/Location	Patch Size (acres) Alt. 1	Patch Size (acres) Alt. 2	Patch Size: (acres) Alt. 3	Patch Size: (acres) Alt. 4
Area North of U.S. Highway 12				
Black Mountain East	2,405			
Black Mountain West	4,345	12,390	12,390	12,255
Upper Deadman Creek	4,805			
Right Hand Jerusha Gulch	1,620	1,620	1,620	1,620
Esmeralda Hill – Clark's Canyon	1,540	1,890	1,890	1,890
Upper Snowshoe Creek	3,160	3,160	3,160	3,160
Greenhorn Mountain	2,455	2,725	2,725	2,725
Sweeny – Austin Creeks	4,210	5,805	7,535	7,535

[6] The formula for weighting roads is derived from the *Wildlife Documentation* for the *Helena Forest Plan* (USDA 1983, p. 12). Until 2010, this formula was used to calculate open road densities for *HFP* Big Game standard 4a (see USDA 2007e)—and it seemed more appropriate for comparing different degrees of habitat fragmentation than the newly adopted big game formula (see "Fall Elk Security", p. 38 above). However, introduced one modification to the original system was introduced—tallying private roads that are closed to the general public at 25% of length, rather than leaving them out of the calculation altogether. Another difference is that the "fragmentation" calculation is confined to the travel planning area (including inholdings) while the "big game" calculation includes a zone 1.5 miles beyond the Forest boundary.

Area Identification/Location	Patch Size (acres) Alt. 1	Patch Size (acres) Alt. 2	Patch Size: (acres) Alt. 3	Patch Size: (acres) Alt. 4
Priest Pass – Austin Creek	1,595			
Little Porcupine Creek	3,080	3,400	3,670	3,670
Area South of U.S. Highway 12				
Lazyman – Black Mountain	13,310	13,310	13,310	13,310
Jericho Mountain	3,320	3,725	3,725	3,725
Minnehaha Creek – Walker Creek – Mike Renig Gulch	9,475	9,260	9,260	9,260
Lee Mountain	2,565	2,565	2,565	2,565
Red Mountain	3,185	3,185	3,185	3,185
Spotted Dog – Trout Creek	3,590	3,590	3,590	3,590
Upper Elliston Creek – Slate Lake	5,240	9,530		
Hat Creek – Kading	4,295			14,390
Upper Spotted Dog Creek North	2,590	2,590		
Upper Spotted Dog South	< 1,500 acres [7]	< 1,500 acres	52,705	
Electric Peak		28,380		31,350
Bison Creek – Ontario Creek	34,435			
Treasure Mtn – Ontatio Creek		4,780		6,965
Negro Mountain North	2,105	< 1,500 acres	< 1,500 acres	< 1,500 acres
Totals				
Non-Motorized Patch Acres North of Hwy 12	29,215	30,990	32,990	32,855
Non-Motorized Patch Acres South of Hwy 12	84,110	80,915	88,340	88,340
Total Acres in Large Non-Motorized Habitat Patches	113,325	111,905	121,330	121,195

The data in Table 3.57 are summarized in Table 3.58 in terms of the number of large non-motorized patches, average patch size, and the percent of the Plan Area occupied by such habitat. Alternatives 2, 3 and 4 would enlarge average patch size and reduce the number of patches (compared to current conditions) by lumping unroaded areas north of Highway 12 between Sweeny and Austin Creeks and in the Black Mountain–Deadman Creek area. As discussed earlier, an array of larger patches (even if unconnected) is believed to provide greater habitat opportunity than a collection of numerous smaller patches connected by narrow corridors.

[7] Areas less than 1,500 acres in size are *not* added into the total as "large" non-motorized patches.

South of Highway 12, Alternative 2 would consolidate patches in the Slate Lake–Hat Creek area but split an unroaded block in Ontario–Bison Creek with a motor trail. Alternative 3, on the other hand, would combine three separate unroaded patches in the Slate Lake–Hat Creek–Spotted Dog area and enlarge the Bison Creek–Ontario Creek—Electric Peak block. Alternative 4, like Alternative 2, would split the Bison-Ontario Creek block and the Hat Creek-Spotted Dog block with motorized routes; but the resulting unroaded blocks would be larger than in Alternative 2. Overall, Alternative 2 would slightly reduce the amount of land in large non-motorized patches compared to the Existing Condition (Alternative 1), while Alternatives 3 and 4 would substantially increase it.

Table 3.58 Summary of large non-motorized habitat patches (greater than 1,500 acres) in the Divide Travel Plan Area

Area Identification / Location	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt.4**
Area North of U.S. Highway 12				
Number of Patches	10	7	7	7
Average Size of the Patches	2,922 ac	4,427 ac	4,713 ac	4,694 ac
Percent of Plan Area in Large Non-Motorized Patches	45 %	47 %	50 %	50 %
Area South of U.S. Highway 12				
Number of Patches	11	10	7	9
Average Patch Size	7,646 ac	8,091 ac	12,620 ac	9,816 ac
Percent of Plan Area in Large Non-Motorized Patches	75 %	72 %	79 %	79 %
Total Plan Area				
Number of Patches	21	17	14	16
Average Patch Size	5,396 ac	6,583 ac	8,666 ac	7,575 ac
Total Acreage in Plan Area in Large Non-Motorized Patches	113,325 ac	111,905	121,330	121,195
Percent of Plan Area in such Patches	64 %	63 %	68 %	68 %

The benefits of establishing and maintaining corridors between suitable habitat patches versus enlarging patches in which various species can survive over time has been analyzed by Falcy and Estades (2007). They conclude that enlarging viable habitat patches is a more productive strategy than trying to maintain corridor connections between smaller patches. Rosenberg *et al.* (1997) reached a similar conclusion. In the case of the Divide landscape, none of the patches are truly isolated from any other (although Highway 12 does present a formidable barrier for some species). So, alternatives that consolidate and enlarge effective living space would be the most beneficial for local wildlife. This pattern of larger unroaded patches would also facilitate movement through the Divide landscape linkage zone. In this regard, Alternative 1 is the least effective; Alternative 2 is more effective; and Alternatives 3 and 4 are the most effective.

None of the alternatives would influence the more prominent roads that retard or alter efficient wildlife movement through the Divide landscape. These include U.S. Highway 12, the Rimini road (Powell County Road #495), the Little Blackfoot River road (Forest Road #227), the Mullan Pass–Austin Creek road (Forest Road #1805), the Sweeny Creek–Priest Pass road (Forest Road #335), the Orofino Gulch road (Lewis & Clark County Road #454), and the Grizzly Gulch road (County Road #753).

Alternative 1, No Action

Alternative 1 would preserve the existing condition, which currently maintains 21 non-motorized habitat blocks larger than 1,500 acres on public land in the travel planning area—the 10 patches north of U.S. Highway 12 average 2,922 acres in size, the 11 patches south of the highway average 7,707 acres. Patch size south of the highway is influenced by the 3 inventoried Roadless Areas in that part of the Plan Area. Overall patch size averages 5,396 acres. Roughly 64% of HNF land is in large non-motorized patches under Alternative 1.

Alternative 2

Alternative 2 would reduce the number of large non-motorized habitat patches from 21 to 18 by consolidating unroaded areas between Sweeny and Austin Creeks and in the Black Mountain–Deadman Creek area. As a result, average size of these habitat blocks north of Highway 12 would increase from 2,922 acres to 4,427 acres. This would benefit a number of resident wildlife species and would make movement through the linkage zone less problematic. The alternative would consolidate non-motorized patches in the Slate Lake–Hat Creek area but would split a non-motorized habitat block in the Ontario–Bison Creek area with a motor trail (on currently closed Roads #4104-A1 and #4104-A2), reducing average patch size south of the highway from 7,707 acres to 7,506 acres. Nevertheless, average patch size in the planning area as a whole would increase from about 5,428 acres to 6,309 acres.

While increasing average patch size, Alternative 2 would slightly reduce the total amount of land in large non-motorized patches compared to the existing condition. In the Slate Lake – Hat Creek area, for example, the proposal combines 2 non-motorized patches, but at the same time, it shaves the size of the Slate Lake portion by designating a new motorized trail in a currently restricted area. On balance, the improvement in non-motorized patch size would be favorable to wildlife movement through the area, more than making up for the slight overall loss of non-motorized acreage.

Alternative 3

Alternative 3 would reduce the total number of large non-motorized habitat patches from 21 to 16 by combining some of the unroaded areas north of Highway 12 between Sweeny and Austin Creeks and in the Black Mountain–Deadman Creek area. It is similar to Alternative 2 in this regard, but by elminating additional motorized routes toward the periphery of the consolidated patches, it would produce larger non-motorized blocks than Alternative 2. Average patch size north of Highway 12 would increase from 2,922 acres to 4,713 acres.

South of Highway 12, Alternative 3 would merge 5 separate non-motorized patches north of, east of, and including the Electric Peak Roadless Area into a single non-motorized habitat block of 52,705 acres. Unlike Alternative 2, it would retain the integrity of the Bison–Ontario Creek habitat area and would eliminate motor travel in the Baldy ridge area. In sum, Alternative 3 would increase acreage in large non-motorized habitat blocks in the Plan Area from 113,325 acres to 121,330 acres. It would increase the average non-motorized patch size from 5,396 acres to 8,666 acres. Key areas that would see improvement in facilitating wildlife movement through the area would be (1) Black Mountain–upper Deadman Creek, (2) Austin Creek–Sweeny Creek–Priest Pass, (3) Bison Creek–Ontario Creek, and (3) Slate Lake–Hat Creek–Spotted Dog Creek.

Alternative 4

Alternative 4 is similar to Alternative 3, but it provides for more motorized routes in strategic locations, resulting in slightly less acreage in large non-motorized patches (121,195 acres in Alternative 4 as opposed to 121,330 acres in Alternative 3) and somewhat smaller average patch size (7,575 acres in Alternative 4; 8,666 acres in Aternative 3). The increase in patch size would be achieved by consoldation of adjacent areas, thus reducing the total number of large non-motorized habitat patches from the current 21 to 16 (two more than Alternative 3, by virtue of its splitting off the Treasure Mountain and Slate Lake–Hat Creek areas from the central Electric Peak Roadless Area with motorized routes).

Three routes would fragment or reduce the size of non-motorized patches: (1) a motor trail north of Meyers Hill (#136-007), (2) a motor trail following Roads #4104-A1 and #4104-A2 along upper Ontario and Bison Creeks, and (3) Road #314 in upper Spotted Dog Creek. Effects would be felt primarily in the Bison-Ontario and upper Spotted Dog areas as a result of motorized intrusion into high-country summer ranges. The Meyers Hill route would be less problematic. Be that as it may, Alternative 4, while somewhat more disruptive of local wildlife than Alternative 3, would be a substantial improvement over Alternatives 1 and 2 in this regard.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable actions and circumstances, in addition to proposed Travel Management, that may affect connectivity. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings), adjacent National Forest lands (on the Lincoln Ranger District and the Beaverhead-Deerlodge NF), and neighboring non-Forest lands (private, State, County, municipal, and BLM). This summary is common to all alternatives.

Forest Service Past and Ongoing Activities

Several recent and ongoing activities on the National Forest have implications for habitat connectivity and the way animals move through the landscape. Actions that have improved connectivity and habitat quality in the Divide linkage zone include: Implementation of the Statewide OHV Plan (USDA, USDI 2001), which prohibits riding off established motor routes; a variety of trail relocation projects that have removed trails from sensitive wildlife areas likely to serve as local movement corridors to upslope locations; mine reclamation projects that have improved the functioning of riparian habitats likely to attract animals moving through a linkage zone; grazing allotment revisions that have generally reduced cattle numbers and improved habitat condition; and road and motor trail closures associated with timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Lava Mountain, Treasure Mountain).

Activities that have reduced effectiveness of connectivity or had a mixed impact (negative for some species, positive for others) include: timber harvest that has created large clearcuts (Bison Creek, Mike Renig-Hahn Creek, Deadman Creek, Slate Creek, Ophir Creek-Cave Gulch, Lump Gulch, Lava Mountain, Mullan Pass); road permits allowing access across HNF land to private holdings; retention of recreational residences on HNF land (as at MacDonald Pass); small mining operations (under the 1872 Mining Act); construction and maintenance of power lines and communications sites; Forest road improvement projects that have widened road corridors; and fencing associated with grazing allotments that can impede movement by some animals.

Recently, harvest of snags from the mountain pine beetle outbreak have created “clean” openings in the forest,whereas natural processes eventually would have produced openings full of large woody debris. So far, most of these projects have been along roads and at developed recreation and administrative sites, and so have had little impact on unroaded habitat.

Adjacent Private and Other, Past and Ongoing Actions

Private land development (esp. rural home building) continues to create sites that make it more dificult for animals to move through the landscape. Problems also come from new and upgraded roads, mining operations, ATV-trail bike riding areas, private timber harvest, clearing of vegetative cover from riparian sites, and widening and paving of the Marysville road.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect connectivity to one degree or another include improvement of the Rimini Road and projects designed reduce fuel accumlations and salvage dead trees created by the on-going bark beetle outbreak—in particular the Telegraph and Red Mountain Flume-Chessman Reservoir projects.

Adjacent Private and Other, Reasonably Foreseeable Actions

Activity on non-Forest land within the cumulative effects area that is expected to continue in the future and that may affect connectivity includes: settlement and associated development of private lands (including road building); timber harvest and removal of beetle-killed dead trees; continued mining operations that usurp habitat and create disturbance zones (most notably, the Montana Tunnels mine expansion); and, continued ATV and other motorized activity.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Alternative 1 would retain current open road density (weighted) of 0.84 mi/mi². Acreage of large non-motorized habitat patches (larger than 1,500 acres) would remain unchanged at 113,325 acres (63.7% of all land in the travel planning area).

Under Alternative 2 , open road density would decline slightly to 0.83 mi/mi². The area occupied by large non-motorized habitat patches would decrease slightly to 111,905 acres (62.9% of all land ownerships).

Alternative 3 would lower weighted open road density to 0.76 mi/mi² and increase the total of of large non-motorized habitat patches to 121,330 acres (68.2% of lands in the Plan Area).

Alternative 4 would allow for a slightly higher weighted open road density than Alternative 3—0.78 mi/mi²—but less than Alternatives 1 and 2. Area covered by large non-motorized blocks would increase over current acreage to 121,195 acres—slightly less than Alternative 3, but more than Alternatives 1 and 2.

Dirt/gravel Forest roads would not physically “fragment” the environment in ways meaningful to most wildlife species. Differences between alternatives would arise from the degree to which they provide refuges free from human interference along open roads and motor trails. In this regard, Alternatives 1 and 2 would be similar. Alternatives 3 and 4, on the other hand, would provide a number of new opportunities for wildlife use of non-motorized habitat patches.

Forest Plan Consistency

All alternatives would comply with appropriate legal mandates and management direction with regard to the impacts of roads and motor trails on connectivity and fragmentation. The *Helena Forest Plan* has no standards or guidelines that deal directly with this issue—although some of those dealing with big game and grizzly bear habitat are relevant.

Snags and Woody Debris

Common Effects of Travel Management

Direct Effects

Direct effects of Forest roads on snags and coarse woody debris stem from initial clearing of the road corridor, leading to conversion of suitable habitat to non-habitat for the long term (Hann *et al.* 1997, Reed *et al.* 1996, Trombulak and Frissell 2000). The same is true for motor trails—though to a lesser degree since most trail corridors are relatively narrow. As none of the Divide travel plan alternatives propose any new road or trail construction, no direct effects follow.

Indirect Effects

Indirectly, roads negatively impact snags and logs by providing access for firewood retrieval (Hann *et al.* 1997; Hamann *et al.* 1999; Bate and Wisdom 2002a, 2002b). Traditionally, these effects were limited to the distance a person could cut and carry firewood to a vehicle. Now, firewood retrieval is enhanced by technology, such as cable systems, and by increased access through off-road driving (Bate and Wisdom 2002a). Formal studies that quantify the indirect impacts of roads on snags and logs have been lacking until two recent studies in Montana and Oregon (Bate and Wisdom 2002a, 2002b).

Standing Dead Trees

Bate and Wisdom (2002a) found only a third as many standing dead trees near roads when comparing snags in roaded and un-roaded landscapes. Snag attrition was highest within 150 feet of roads (300 ft corridor) and generally became unimportant beyond 600 feet. Effects were greater in ponderosa pine communities than in other mixed coniferous forests (Bate and Wisdom 2002b).

Table 3.59 displays estimates of how much habitat in the travel planning area would likely be susceptible to “roadside” snag removal under different alternatives. Data from the marten habitat model (see below) was used to estimate potential large snag habitat, since this is a summation of most of the mature forest habitat in the planning area—where most of the large snags occur. Estimates of the potential firewood retrieval area are shown for distances of 150 feet and 300 feet from the road (the 300-ft corridor and the 600-ft corridor).

The average number of large dead trees (>7 inch dbh) in these areas is a fluid quantity at present because of the plethora of new snags that is being generated by the mountain pine beetle infesation. Snag numbers would be high in stands dominated by ponderosa pine and, especially, by lodgepole pine and usually much lower in stands dominated by other conifer species. For snag-associated wildlife, loss of standing dead trees means loss of nesting, roosting, and foraging habitat, as well as hiding and thermal cover (see also black-backed, pileated, and hairy woodpecker analyses and marten analysis below for additional discussion of the effects of snag removal on wildlife).

Technically, the “300-foot rule” incorporated into all three action alternatives, allows off-road vehicle use in the 600 foot road corridor only for dispersed camping—not for firewood cutting. However, it is likely that many firewood gatherers would continue to drive off-road a certain distance to load firewood (as is common practice now). Also, under this rule, it would be permissible to cut firewood from an occupied dispersed camp site up to 300 feet off the road. The potential loss of snags to firewood cutters in any given section of road corridor would be mediated by topography natural impediments (steep slopes, streams, rock outcrops).

Table 3.59 Potential snag removal zone along open roads in mature forest habitat (145,655 acres) in the Divide Travel Plan Area*

	Alt.1	Alt.2	Alt. 3	Alt. 4
Miles of Open Road in Mature Forest Habitat	294 mi	260 mi	233 mi	235 mi
Maximum Acreage of the 300-ft Snag Removal Corridor	10,650 ac	9,450 ac	8,485 ac	8,545 ac
Maximum Acreage of the 600-ft Snag Removal Corridor	21,300 ac	18,900 ac	16,970 ac	17,091 ac
Percent of Planning Area Mature Forest in the 600-ft Corridor	15 %	13 %	12 %	12 %

* Mature Forest Habitat is derived from data for American marten habitat [see later in this report] and provides a minimal estimate of road miles along which large snags are available.

Large Woody Debris

Effects on logs in the road corridor are a direct result of snag attrition and removal for firewood. Bate and Wisdom (2002b) found that log densities along open roads were substantially lower than those along closed roads. The areas vulnerable to large log attrition are thus the same as those for snags. In general, the 300 ft corridor is likely to have more remaining large logs than snags: some snags will fall before they are taken for firewood, and if not solid, will be left in place by firewood gatherers. This would be the case more often with the more punky ponderosa pine logs than with lodgepole pine. The 600-ft corridor would retain more logs because of the greater difficulty of retrieving logs further from the road. In both cases, steep slopes, rough terrain, and otherwise difficult ground would limit the extent of the roadside zone from which snags and logs are taken. On a steep downward slope, for example, 25-50 feet may be all the distance most firewood cutters would be willing to venture off the road to retrieve a fallen snag.

As with snags, the loss of logs and other coarse woody debris represents a diminution of foraging, denning, nesting, and resting sites, as well as cover and refuge for a variety of wildlife species (Rose *et al*. 2000). Other indirect effects associated with removal of large logs include influence on basic ecosystem processes—soil development and productivity, nutrient immobilization and mineralization, and nitrogen fixation (Rose *et al.* 2000).

Alternative 1, No Action

Direct Effects

There would be no direct effects on snags and coarse woody debris beyond what has occurred during past road and trail construction. New construction is not part of Alternative 1.

Indirect Effects

Alternative 1 would preserve the existing condition in which roughly 10,650 acres of roadside forest (about 7% of the resource) are open to removal by firewood cutters in the 300-ft road corridor and 21,300 acres (nearly 15% of the resource) are open in the 600-ft corridor.

Alternative 2

Direct Effects

There would be no direct effects on snags and coarse woody debris beyond what has occurred during past road and trail construction. New construction is not part of Alternative 2.

Indirect Effects

Alternative 2 would reduce the area available to firewood cutting to about 9,450 acres in the 300-ft road corridor and to about 18,900 acres in the 600-ft corridor. This would be a reduction of about 11% in the area vulnerable to snag and log loss along roads compared to current circumstances.

Alternative 3

Direct Effects

There would be no direct effects on snags and coarse woody debris beyond what has occurred during past road and trail construction. New construction is not part of Alternative 3.

Indirect Effects

Alternative 3 would reduce the area available to firewood cutting to about 8,485 acres in the 300-ft road corridor and to about 16,970 acres in the 600-ft corridor. This is a reduction of about 20% in the area vulnerable to snag and log loss along roads compared to existing condition.

Alternative 4

Direct Effects

There would be no direct effects on snags and coarse woody debris beyond what has occurred during past road and trail construction. New construction is not part of Alternative 4.

Indirect Effects

Alternative 4 would reduce the area potentially available to firewood cutting from around 10,650 to 8,550 acres in the 300-ft road corridor and from around 21,300 to 17,100 acres in the 600-ft corridor—slightly more available acres than in Alternative 3. This is a decline of nearly 19% in the area vulnerable to snag and log loss along roads compared to existing condition.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect large snags and coarse woody debris habitat. The scope of the analysis includes the Divide landscape (HNF land, non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM).

Forest Service Past and Ongoing Activities

Activities that have cumulatively reduced snags or the potential for snag creation include a number of past timber sales that have created large clearcuts with minimal residual snags or replacement snags (Bison, Ontario, Upper Telegraph, Mike Renig-Hahn Creek, Slate Creek, Lump Gulch-Strawberry, Ophir Creek-Cave Gulch, Deadman, Cellar Gulch). Some projects (Mike Renig, Upper Telegraph, Hope-Snowshoe) were specifically designed to remove dead, dying, and decadent trees. The ongoing Clancy-Unionville project in the upper Lump Gulch and Quartz Creek drainages, originally designed to harvest green trees, is now focused primarily on removing dead trees. Recent Carbaryl spraying of campgrounds and other administrative sites (Cromwell Dixon campground, MacDonald Pass trailhead) has been intended to prevent large trees from dying in areas of concentrated public use. This enterprise has met with limited success and thus has not been a major factor in suppressing snag creation.

Firewood cutting on the National Forest is the primary factor driving the removal of most large snags from Forest road corridors. Ongoing efforts by the HNF to limit the potential safety hazard posed by large numbers of dead trees in areas frequented by the public have accelerated the process of snag loss in road corridors and other accessible sites. These actions have also reduced the number of snags available to firewood cutters. Hazard tree removal projects have recently been completed or are going forward at a number of campgrounds (Cromwell Dixon, Moose Creek, Kading, Park Lake), day-use areas (Moose Creek, MacDonald Pass), trailheads (MacDonald Pass CDNST), administrative sites (Moose Creek ranger station, Kading cabin), as well as along open Forest roads.

Recent and ongoing activities on the National Forest that have improved prospects for snags are the road closures associated with a number of timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain, Lava Mountain), which limit roadside firewood cutting. These projects have all adhered to *Forest Plan* standards for retaining snags and replacement snags. In some cases, decisions not to pursue potential salvage opportunities (Jericho Mountain, Snowshoe Creek, MacDonald Pass burn) have resulted in retention of large blocks of snags.

Adjacent Private and Other, Past and Ongoing Actions

Numerous dead tree salvage operations on private land within and adjacent to Forest boundaries are eliminating many of the snags being created by the current bark beetle infestation. As well, private land development is slowly eroding snag presence on many local sites. Many thinning and snag removal projects on private, City, and State land have been driven by the desire to reduce the potential for catastrophic fire and, in some cases, to remove hazards to public safety.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect snag density and distribution on the National Forest include proposals to deal with the effects of the ongoing bark beetle epidemic: MacDonald Pass Ski Trails Hazard Tree Removal, Telegraph Creek Fuels Reduction and Pre-commercial Thinning and the Red Mountain Flume-Chessman Reservoir project.

Adjacent Private and Other, Reasonably Foreseeable Actions

Activity on non-Forest land within the cumulative effects area that is expected to continue in the future and that may affect snags includes the continuation of land development, thinning for fire prevention, and dead tree salvage.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Alternative 1 would retain approximately 294 miles of open road corridor available to firewood cutters in mature forest habitats. Within a 600 ft road corridor, this represents 14.6% of mature forest in the travel planning area.

Under Alternative 2 , road corridor open to firewood cutters would decline to 260 miles in mature forest. Assuming a 600 ft road corridor, this amounts to 13.0% of mature forest habitat in the travel planning area.

Under Alternative 3, open road corridor available to firewood cutting and snag removal would decline to 233 miles in mature forest. With a 600 ft road corridor, this amounts to 11.7% of mature forest habitat in the travel planning area.

Alternative 4 is similar to Alternative 3. It would maintain 235 miles of road corridor open to firewood cutting in mature forest. Within a 600 ft road corridor, this would represent 11.7% of mature forest in the travel planning area.

Dead trees are prolific on the landscape in the wake of the ongoing bark beetle infestation, and snags in Forest road corridors susceptible to harvest by firewood cutters represent a relatively small proportion of the available resource.

Forest Plan Consistency

All alternatives would comply with appropriate snag standards and guidelines in the Helena Forest Plan and with guidance in the Northern Region Snag Management Protocol (USDA 2000) and Estimates of Snag Densities for Eastside Forests in the Northern Region (Bollenbacher et al. 2008).

Big Game: Elk

Effects of travel management on elk are discussed primarily in terms of (1) habitat effectiveness on summer range, (2) human disturbance on winter range, and (3) elk security in the fall. Implications for compliance with current *Helena Forest Plan* standards are discussed with regard to (1) hiding cover and calving sites on summer range , (2) thermal cover on winter range, and (3) open road density/ hiding cover ratios on fall range.

Common Effects of Travel Management

Big Game Summer Range

Rationale for Management

Energetic demands of elk—growth, development, lactation—are high during the summer months as animals are simultaneously recovering from weight lost during the previous winter, supporting young of the year through lactation, and building fat reserves for the coming winter. Motorized activities impact elk through direct disturbance and, potentially, displacement from high-quality habitats, resulting in lowered reproductive performance. As well, new road construction and cross-country ORV use can degrade or eliminate segments of productive summer elk habitat—in particular, local wet habitats (subirrigated meadows, streamside habitat, drainage-head basins)—thus reducing habitat potential on summer range (Grover and Thompson 1986; Hamilton 1997; Rowland *et al.* 2003; Ward and Cupal 1979).

Wisdom *et al.* (2004) indicate that off-road recreation—motorized and non-motorized—increases movement rates and flight responses of elk. Elk react more to ATV and mountain bike riding than to horseback and hiking activities (though mule deer may respond more to hikers). Elk energy reserves may deteriorate as a cost of fleeing from off-road activity on a regular basis because of increased movement and displacement from foraging habitat.

Summer Range: Forest Plan Standards

The *Helena Forest Plan* uses hiding cover as the primary indicator of summer range quality. The rationale is that "[t]he total amount of hiding cover on summer habitat is an important part of the overall elk habitatat capability" (USDA 1983]. Big Game Standard 3 specifies that hiding cover is to be maintained at or above 35% (as per the USFS definition) or 50% (as per the MFWP definition) of the elk/deer summer range within each elk herd unit or equivalent analysis area (*HFP,* p. II/18). Standard 5 then specifies that in order to be tallied as part of this "*Forest Plan* hiding cover"the cover must occur in blocks of 40 acres or more (*HFP,* p. II/19). In this analysis, we use the MFWPdefinition of hiding cover (in which ≥40% canopy closure is used as a surrogate for actual hiding cover as measured on the ground), and we thus aim for ≥50% canopy closure on elk summer range.

Forest Plan Big Game Standard 3 stipulates that 35 % of summer range within each elk herd unit should be maintained as *Forest Plan* hiding cover. When hiding cover is measured indirectly via crown closure, 50% of the range needs to be maintained at 40% crown closure (MDFWP hiding cover). Table 3.60 shows the current status of Forest Plan hiding cover in the Divide landscape.

Table 3.60 Status of Divide elk herd units as per *HFP* Big Game Standard 3—which requires ≥50% MDFWP hiding cover on elk summer range. Hiding cover would be the same under all alternatives.

	Little Prickly Pear–Ophir	**Greenhorn**	**Spotted Dog – L. Blackfoot**	**Jericho**	**Black Mtn – Brooklyn Br.**	**Quartz**
Percent Hiding Cover	46 %	56 %	59 %	65 %	52 %	45 %
HFP compliance	no	yes	yes	yes	yes	no

Currently, two herd units are below the 50% threshold and four units are above it. No travel plan alternative would affect *Forest Plan* hiding cover, and any changes in cover generated by other factors (most notably, losses to mountin pine beetle) would be the same for all alternatives. This standard is thus not useful in differentiating between travel plan alternatives and potential effects on summer range.

The Divide travel plan would have no effect on the status of *Forest Plan* hiding cover, and any ongoing and future changes in hiding cover generated by other factors (most notably, losses due to mountin pine beetle infestation) would be the same for all alternatives. Application of this *Forest Plan* indicator thus leads to the conclusion that summer habitat quality would be identical under all alternatives—a result that is problematic, given the different road and motor trail configurations in elk summer range under the various alternatives.

Summer Range: Habitat Effectiveness

Because roads have have long been known to influence how elk are able to use summer habitat (see Lyon 1979, 1982, 1985), we have employed "habitat effectiveness", which is based on open road density, as an additional means of detecting potential differences in how alternatives impact elk summer range. As it turns out, overall elk habitat effectiveness (HE) for the travel Plan Area, as measured by weighted open road density from late spring through early fall, is roughly the same among the four alternatives (72% – 74%). The alternatives vary more, however, in the habitat effectiveness they provide in some individual herd units. All 6 herd units are well above the minimum 50% level recommended for elk summer range (Christensen *et al.* 1993) under each of the four alternatives. The current range of HE values runs from 65% in the Little Prickly Pear–Ophir EHU to 87% in the Black Mountain–Brooklyn Bridge EHU [see Table 20].

Calf production and survival in local hunting districts, as indicated by cow/calf ratios are in line with MFWP objectives for this area—35-40 calves/100 cows (MT Elk Management Plan 2004)—which is a good indication of suitable habitat effectiveness on summer range. The status of summer range in local elk herd units and hunting districts has been discussed in detail in the "*Affected Environment"* segment of this report. Specific instances of how different alternatives may funnel human activity into or away from elk calving areas are provided toward the end of this report in the section dealing with "*Local Effects in Key Areas"*. That analysis provides information relevant to *HFP* Big Game standard 4b, which seeks to minimize motorized disturbance in these key habitat areas (*HFP,* p. II/18).

Table 3.61 summarizes open road density and consequent habitat effectiveness on summer range under the four travel management alternatives. The percentages are estimates of the proportion of summer range free from motorized disturbance throughout the season. They are based on an index developed by Lyon (1983) and employed by Christensen *et al.* (1993), who recommended habitat effectiveness levels of

at least 50% on elk summer range as a whole and 70% in areas of key summer range (productive sites where elk consistently concentrate). Habitat effectiveness is not a *Forest Plan* standard, but because it is based on open route density, it relates more directly to travel planning proposals than does hiding cover.

Table 3.61 does show some differences between alternatives in four of the herd units in the travel planning area. However, none of these differences represents a major shift in habitat effectiveness, and all herd units remain well above the 50% threshold under all alternatives. The inference is that in all cases, elk would have available to them enough generalized summer range free from motorized interference to meet their needs. On the other hand, the habitat effectiveness index says nothing about the quality of the summer range that the elk have regular access to under different alternatives. This table does not calculate the habitat effectiveness of key areas (esp. wet meadows, mesic grasslands, and riparian sites) where the 70% recommendation would apply. Some of these issues are addressed in the later section, *"Local Effects in Key Areas",* which looks at how individual motorized routes effect habitat sites of particular importance to elk and other big game animals.

Table 3.61 Elk Habitat Effectiveness,as determined by weighted open road density (mi/mi^2), on summer range by Elk Herd Unit and alternative *

Elk Herd Unit	**mi/mi^2 open roads**			**	**% habitat effectiveness**			
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Little Prickly Pear—Ophir	0.8	0.8	0.8	0.8	66 %	66 %	66 %	66 %
Greenhorn	0.6	0.5	0.4	0.4	73 %	75 %	77 %	77 %
Spotted Dog – Little Blackfoot	0.7	0.8	0.6	0.7	68 %	66 %	73 %	68 %
Jericho	0.7	0.6	0.6	0.6	68 %	73 %	73 %	73 %
Black Mtn—Brooklyn Bridge	0.2	0.2	0.2	0.2	87 %	87 %	87 %	87 %
Quartz	0.5	0.5	0.5	0.5	75%	75 %	75 %	75 %
Divide Plan Area	**0.6**	**0.6**	**0.6**	**0.6**	**73 %**	**73 %**	**73 %**	**73 %**

* Open Road density is translated to percent habitat effectiveness using a curve generated by Lyon (1983).
** These densities are derived from weighted road miles (USDA 2007e): collector and arterial roads are calculated at 100% of length; lightly used local roads are calculated at 25% of length.

Alternative 1, No Action

With regard to *Forest Plan* Big Game Standard 3, four herd units would remain in complaince with the standard (with crown closure ≥50% and hiding cover thus ≥35%) and two units would remain slightly below the compliance threshold. In the next 10 years, it is highly likely that all herd units would be below 35% hiding cover due to mountain pine beetle generated mortality.

Alternative 1 maintains the status quo. Under this scenario, all herd units exceed recommended 50% habitat effectiveness on summer range by an ample margin. Habitat effectiveness of this order suggests that open road density is not high enough to regularly prevent elk on summer range from foraging successfully and thus building fat reserves for the upcoming winter. In this case, problems with roads and motor trails are not a function of overall road density—which is well within acceptable limits—but with site-specific intrusion of vehicles into habitats of particular importance to elk—typically riparian areas, wet

meadows, and other productive sites that focus elk activity. Some of these areas are discussed in *"Local Effects in Key Areas"* toward the end of this report.

Alternative 2

Summer range hiding cover would remain the same as in Alternative 1.

Alternative 2 would retain the same general level of habitat effectiveness as Alternative 1 for the travel planning area as a whole, but shifts would occur within individual herd units. Habitat effectiveness would improve in three units (Little Prickly Pear–Ophir, Greenhorn, and Jericho), decline in one unit (Spotted Dog – Little Blackfoot) and hold steady in two units (Quartz, Black Mtn–Brooklyn Bridge) [see *Local Effects in Key Areas* for a discussion of what the changes mean for elk in specific areas]. One area where habitat effectiveness would erode is the Baldy Ridge–upper Spotted Dog region near the south end of the Plan Area. This area holds elk through the summer and into the fall. Effectiveness would improve in the areas south of Jericho Mountain (enhancing the integrity of the Roadless Area) and in several sites along the Divide between Greenhorn Mountain and MacDonald Pass.

Alternative 3

Summer range hiding cover would remain the same as in Alternative 1.

Alternative 3 would see the greatest upswing in habitat effectiveness. There would be notable improvement in the Spotted Dog – Little Blackfoot, Greenhorn, Jericho, and Little Prickly Pear–Ophir EHUs (about 3% in each case). The Quartz and Black Mountain–Brooklyn Bridge EHUs would remain essentially the same as they are now. All EHUs would continue to achieve the recommended 50% habitat effectiveness level.

Alternative 4

Summer range hiding cover would remain the same as in Alternative 1.

Alternative 4 would provide habitat effectiveness similar to Alternative 3, but it would increase motorized access to elk summer range in some local areas—most importantly in 2 areas in the Spotted Dog – Little Blackfoot EHU: (1) in upper Ontario and Bison Creeks and (2) along upper Spotted Creek and adjacent Baldy Ridge. Both areas encompass drainage-head locales with productive summer habitat that holds elk from late spring through mid fall. Overall habitat effectiveness in Alternative 4 would fall between that of Alternative 3 and Alternatives 1 and 2. All EHUs would continue to achieve the recommended 50% habitat effectiveness level.

Big Game Security During the Hunting Season

Rationale for Management

In the Divide landscape (as on much of the HNF), elk security/vulnerability during the hunting season is a primary determinant of elk abundance and population structure. While the ability of elk to survive the hunting season is influenced by a number of environmental circumstances, the status of the local Forest road system is often the key factor. Several studies have documented the effect of roads on elk security, population structure, and hunter success (Edge and Marcum 1991; Leptich and Zager 1991; Unsworth and Kuck 1991; Gratson and Whitman 2000). While most studies demonstrate that open roads influence elk distribution during the hunting season and that road closures can lower the kill rate in a given area, at least one study indicates that in certain circumstances road closures do not alter hunter success (Burbridge and Neff 1976 cited in Gratson and Whitman 2000). In an increasing number of cases, displacement of elk from roaded public land into more remote terrain or to inaccessible private land early in the fall can depress hunter success rate throughout the remainder of the season.

Big Game Security: Current Forest Plan Standard

The current *Helena Forest Plan* (1986) standard for measuring elk vulnerability during the hunting season is based on an index that combines open road density and hiding cover (*HFP,* pp. II/17 – II/18: Standard 4a). Hiding cover would change over time, decreasing with losses to fire, commercial timber harvest, thinning, insects and disease, and stand aging, and increasing as conifer regeneration fills in forest openings and the understories of mature stands. However, in this case, hiding cover changes would be the same for all four travel plan alternatives. Thus, the variable that separates alternatives is open road density (see *Affected Environment* for *Elk* for a discussion as to how the HNF determines compliance with the standard).

Under all four alternatives, only 1 EHU (Jericho) complies with Standard 4a. Although open road density would decline under all action alternatives—sometimes substantially—compliance with Standard 4a would not change in any instance. That is, this elk security index is relatively insensitive to shifts in open road density—showing no difference in compliance in spite of declines in the mileage and distribution open roads that would appear to have obvious benefits for elk security in some herd units.

Hiding cover and open road density are the measure of elk vulnerability/security identified in the *Helena Forest Plan* (1986). Table 3.62 summarizes each elk herd unit relative to Big Game Standard 4a (*HFP,* pp. II/17 - II/18) as described previously under "*Affected Environment*". Canopy closure of 40% or greater (as determined by satellite imagery) is used as a surrogate for hiding cover and is correlated with road density via the "MDFWP" formula (*HFP*, p. II-18). Road miles are weighted such that all roads on HNF land are calculated at 100% of length and those on private lands at 25% of length. Elk herd units include all lands within HNF administrative boundaries plus a 1.5 mile extension beyond the boundary. The assessment is for entire EHUs, not just the portions that fall within the Divide travel planning area.

Table 3.62 Hiding cover, weighted open road density, and consistency with the current *Forest Plan* Big Game security standard (Standard 4a) for elk herd units under each alternative

Elk Herd Unit	**% hiding cover**	**Open Road Density (mi/mi²)**				**Compliance with Standard 4a?**			
		Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Little Prickly Pear–Ophir	43 %	1.6	1.5	1.5	1.5	no	no	no	no
Greenhorn	30 %	1.8	1.6	1.5	1.5	no	no	no	no
Spotted Dog–Little Blackfoot	59 %	1.2	1.2	1.0	1.0	no	no	no	no
Jericho	65 %	1.2	1.2	1.1	1.1	yes	yes	yes	yes
Black Mtn Brooklyn Bridge	52 %	1.9	1.9	1.9	1.9	no	no	no	no
Quartz	45 %	1.1	1.1	1.1	1.1	no	no	no	no

The first four elk herd units in Table 3.62 show differences in open road density between alternatives, but these differences do not translate to any changes in *Forest Plan* compliance with regard to the big game security index (Standard 4a) [although it should be noted that the Spotted Dog–Little Blackfoot EHU comes very close to compliance in Alternatives 3 and 4].

For all alternatives, the single herd unit that is currently in compliance with the standard would remain so and the five herd units that do not comply with the standard would remain out of compliance. In sum, the standard does indicate to what degree the changes in road density improve or degrade the habitat situation for elk.

Big Game Security: Proposed Forest Plan Standard

The HNF is proposing to replace the current *Forest Plan* big game security index (Standard 4a) with a new standard that is less dependent on "open road density" *per se* than it is on the *pattern* of open roads and motor trails on the landscape (see the previous discussion in *"Affected Environment"*). While retaining hiding cover as an important determinant of security, the new standard would not require a specific percentage of cover relative to open road density. This approach is based on "*U.S. Forest Service and Montana Department of Fish, Wildlife and Parks Collaborative Overview and Recommendations for Elk Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests"* [FS/MFWP Big Game Working Group (USDA and MFWP 2013)] and is detailed in the *Forest Plan Amendment for Big Game Security for Divide Travel Planning* (*EIS*, Appendix D). Application of this "elk security" approach to the Divide travel plan and to future projects in the travel planning area is summarized as follows:

Definitions:

Elk security is a measure of the degree to which habitat conditions (both natural and human-generated) enable elk to survive the hunting season. On the HNF, this is considered to be primarily a function of hunter access, and in particular, *motorized hunter access*. Elk Security is expressed as the percentage of *hunting season home range within HNF administrative boundaries* occupied by *effective elk security areas*.

Basic elk security areas are defined according to parameters developed by Hillis *et al.* (1991): they are non-linear, predominantly forested blocks of habitat at least 250 acres in size with all borders ½ mile from open roads and motor trails. These are minimum criteria, and site-specific assessment will be needed to determine if a basic security area is, in fact, *effective* or if its borders need to be adjusted to compensate for local environmental factors (such as gentle terrain, insufficient cover, internal networks of closed roads and trails, etc.). If it is determined that the area cannot provide elk with effective security, it should be dropped from consideration as an elk security area.

Elk security is determined first for individual *elk herd units* (or other equivalent elk analysis units) and then for groups of herd units, if needed to clarify security status. Herd units are fixed analysis areas, and do not shift with variable movement patterns of individual elk herd groups or from one project to another.

Amended Standard

The "amended standard" is presented as "Alternative B" in the *Forest Plan Amendment for Big Game Security for Divide Travel Planning* (*EIS*) and is discussed in some detail in that document. The amendment reads as follows:

"Implement an aggressive road management program to maintain or improve big game security. This will be accomplished in the Divide Landscape of the Helena National Forest by way of the following:

When security areas comprise more than 30% of that portion of an elk herd unit within the HNF administrative boundary, management activities shall not reduce the amount of security areas during the rifle season (approximately October 15 through December 1) to less than 30%. Where security areas comprise 30% or less of that portion of an elk herd unit within the HNF administrative boundary during the general rifle season, management activities shall not result in a further reduction."

These criteria have been applied to the Divide elk herd units described in *"Affected Environment"* sections addressing elk security (pp. 41-48). Hunting districts associated with these herd units and the status of their elk populations with regard to MFWP big game objectives are also described in *"Affected*

Environment" (pp. 58-62). Elk security levels provided by all four alternatives are displayed in Tables 3.63 and 3.64 (following in *"Comparison of Alternatives"*).

Currently, 33.2% of the Divide travel planning area is occupied by elk effective security areas (as adjusted for local conditions). The total contribution of security areas progresses to 34.1% in Alternative 2, 37.6% in Alternative 4, and 37.9% in Alternative 3 (see Table 3.64). For individual EHUs, four are currently near (>29.5%) or above the 30% level. Under Alternative 2, one unit, currently below 30%, would decrease still further, while another would rise above—so that the total number of herd units near or above 30% would remain at four. This number would increase to five EHUs under Alternatives 3 and 4, leaving only one unit—the Little Prickly Pear – Ophir EHU—below the 30% threshold (at 28.7% in both cases).

For the most part, these levels of elk security have been yielding elk populations that exceed MFWP objectives for total elk numbers in the Granite Butte and Deerlodge Elk Management Units (EMUs) (Montana Elk Management Plan 2004). Bull/cow ratios in those portions of the EMUs that overlap the Divide landscape are at or slightly above objectives (currently around 12-14 bulls/100 cows). Given the unregulated mature bull hunt allowed in these areas, this ratio is a good indicator of the adequacy of elk security throughout the Divide landscape.

The nature of elk security and vulnerability in local hunting districts, elk management units, and elk herd units has been discussed in detail earlier under *Affected Environment.*

The amended *Forest Plan* standard for gauging the vulnerability of elk to hunting mortality is based on how much of a given management unit (typically, an elk herd unit) is taken up by elk security areas. The rationale for using this measure has been discussed in some detail in the *"Affected Environment"* section and in the preceding section, *"Common Effects of Travel Management"* (see also *Wildlife SpecialistsReport*, *Appendix H: "Background Information for Amending the Big Game Security Standard in the Helena Forest Plan")*. In order to comply with the new standard, herd units with more than 30% elk security are allowed to lower security only if they remain above 30%; those with less than 30% security are allowed no further decrease [see the previous section on "*Common Effects of Travel Management"* for the exact wording].

Table 3.63 displays total acres of elk security area within HNF administrative boundaries in each of the 6 elk herd units in the Divide landscape for the period October 15 through November 30. Technically, security is delineated only for fall (hunting season) elk range, but in this case, all land in HNF herd units is considered to be potential fall elk range.

Acreages and percentages in Tables 22 and in Table 23 (p. 146) are shown both for security areas derived from standard Hillis analysis (areas ≥ 250 acres, ≥ ½ mi from open roads) and for the Hillis areas adjusted to account for local conditions (cover, terrain, internal road/trail networks, and so on). In all but one herd unit, the "adjusted" acres and percentages would be lower than those for the unadjusted Hills areas (the exception being the Quartz EHU).

Table 3.63 Total acres of elk security area within each of the 6 Divide elk herd units.

Elk Herd Unit	**Standard *Hillis* elk security acres**				***Adjusted* elk security acres**			
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Little Prickly Pear - Ophir	**15,443**	**19,007**	19,007	19,007	14,204	17,062	17,062	17,062
Greenhorn	**3,837**	**7,509**	7,952	8,795	3,433	7,097	7,419	7,921
Spotted Dog - Little Blackfoot	**30,275**	**28,183**	34,682	33,031	28,800	27,024	33,046	31,872

Elk Herd Unit	Standard *Hillis* elk security acres				*Adjusted* elk security acres			
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Jericho	**9,175**	**7,702**	9,454	9,454	8,753	6,523	9,333	9,333
Black Mtn - Brooklyn Bridge	**14,872**	**14,872**	14,872	14,872	13,983	13,983	13,983	13,983
Quartz	**6,682**	**6,682**	6,682	6,682	7,038	7,038	7,038	7,038
North of U.S. Highway 12	**19,280**	**26,516**	**26,959**	**27,802**	**17,637**	**24,159**	**24,481**	**24,983**
South of U.S. Highway 12	**61,004**	**57,439**	**65,690**	**64,039**	**58,574**	**54,568**	**63,400**	**62,226**
Divide Landscape Total	**80,284**	**83,955**	**92,649**	**91,841**	**76,211**	**78,727**	**87,881**	**87,209**

Acreages are shown for (1) security areas derived by standard Hillis methodology and (2) areas adjusted for local environmental factors likely to influence the effectiveness of elk security. The Little Prickly Pear – Ophir and Greenhorn EHUs are north of U.S. Highway 12; the other four EHUs are south of it.

Table 3.64, below, converts the acreages from Table 3.63 to the percentage of each herd unit occupied by elk security areas. Percentages for the *adjusted security areas* in this table are the figures that are used to determine the degree of compliance with the *Forest Plan* objective of 30% security for each herd unit.

Table 3.64 **TABLE 23.** Percent of fall range in each herd unit occupied by elk security areas. In this assessment, all of the area inside HNF administrative boundaries is considered to be "fall range".

Elk Herd Unit	% security with standard *Hillis* areas				% security with *Adjusted* areas			
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Little Prickly Pear - Ophir	26 %	32 %	32 %	32 %	24 %	29 %	29 %	29 %
Greenhorn	18 %	35 %	37 %	40 %	16 %	33 %	34 %	37 %
Spotted Dog - Little Blackft	48 %	44 %	55 %	52 %	45 %	43 %	52 %	50 %
Jericho	31 %	26 %	33 %	33 %	30 %	22 %	32 %	32 %
Black Mtn - Brooklyn Bridge	42 %	42 %	42 %	42 %	39 %	39 %	39 %	39 %
Quartz	29 %	29 %	29 %	29 %	31 %	31 %	31 %	31 %
North of U.S. Highway 12	**24 %**	**33 %**	**33 %**	**34 %**	**22 %**	**30 %**	**30 %**	**31 %**
South of U.S. Highway 12	**40 %**	**38 %**	**43 %**	**42 %**	**39 %**	**36 %**	**42 %**	**41 %**
Divide Landscape Total	**34 %**	**36 %**	**40 %**	**39 %**	**33 %**	**34 %**	**38 %**	**38 %**

Hillis *et al.* have recommended that at least 30% of the fall range in each analysis area, such as a herd unit or larger management area, be maintained as elk security areas if elk vulnerability is to be effectively tempered during the hunting season. The new *HFP* elk security amendment sets this up as an objective:

Herd units with security above the 30% threshold allow for considerably more flexibility in the management of forest vegetation and the road/motor trail network than those that remain below the 30% security level. While some security areas extend out onto non-Forest land beyond the Forest boundary, the acreages and percentages displayed in Tables 3.63 and 3.64 relate only to the portion of the hunting season home range within HNF administrative boundaries (including all non-HNF inholdings in those areas). If the 1.5 mile off-Forest extension is added to the security area calculation, the percentages in Table 3.63 decrease in a majority of herd units, but they increase in others.

Alternative 1, No Action

Alternative 1 is the no-action scenario, and it would retain the existing condition. As to the current big game security index (*HFP* Standard 4a), only one of the six Divide elk herd units (Jericho) complies with the standard—although the Spotted Dog–Little Blackfoot EHU is on the cusp of compliance.

With regard to the amended security area standard, three EHUs (Spotted Dog–Little Blackfoot, Black Mtn–Brooklyn Bridge, and Quartz) are above the recommended 30% security level and a 4th EHU (Jericho) is just below it. The other two EHUs (Little Prickly Pear-Ophir and Greenhorn) are well below the recommended threshold.

It should be noted that in the three sub-threshold EHUs, elk have been able to find refuge on private land beyond the HNF boundary where public hunting is not allowed or to which hunting access is very difficult because of land ownership patterns. These opportunities are more limited in the Greenhorn EHU. While private sanctuaries do not qualify as "security areas" under the Hillis criterea, they do in effect serve the same purpose. And, as a result, elk are more secure on sub-30% EHUs than the security area percentages in Table 3.64 suggest. Elk compensate for the shortage of National Forest security by moving to private-land security zones as the hunting season progresses.

Currently, MFWP population objectives for elk are being met in three of the hunting districts that cover the Divide landscape (HD 215, HD 335, HD 343). In the 4th district (HD 293), elk objectives are being met in the portion of the district associated with the Divide landscape—while problems in the rest of the district are related to high rates of predation rather than deficiency in security habitat (see the previous discussion of "*Hunting Districts"*).

Alternative 2

Alternative 2 would produce the same pattern of *Forest Plan* compliance with the current Big Game security index (*HFP* Standard 4a) as Alternative 1: one elk herd unit (Jericho EHU) would comply, the other five would not.

Applying the amended elk security area standard, overall elk security on hunting season ranges would increase from the current 33% to 34% (from 76,370 acres to 78,897 acres) under Alternative 2. The direction of change would be different, however, for areas north and south of U.S. Highway 12: Security in the two areas north of the highway would increase from 22% to 30%. The largest gain in percent security would be in the Greenhorn EHU as a result of hunting season road/motor trail closures in Sweeny Creek and in the area between MacDonald and Priest Passes. This would move the EHU from well below to a bit above the recommended 30% security level. Security in the Little Prickly Pear–Ophir EHU would improve as a result of motor trail and road closures around Black Mountain and Meyers Hill and in the Ophir Creek drainage.

South of Highway 12, overall security area coverage would decline from 39% to 36%—with two EHUs declining and two unchanged. In the Spotted Dog – Little Blackfoot EHU the decline would come from new open roads in upper Spotted Dog, Telegraph, and Elliston Creeks and a newly sanctioned motor trail near Slate Lake. But, the EHU would remain well above 30% because of the large security area centered on the Electric Peak Roadless Area. Security would also decline in the Jericho EHU, primarily due to a

currently closed road being opened for hunter access in Little Flume and Mike Renig Gulches. This would drop fall security in the EHU from 30% to 22%. Security in the Black Mountain–Brooklyn Bridge and Quartz EHUs—also south of Highway 12—would not change: Most of these herd units lie within the Clancy-Unionville Travel Plan Area to the east and would be little affected by the Divide travel plan.

Alternative 3

Alternative 3 would produce the same pattern of *Forest Plan* compliance with the current Big Game security index (*HFP* Standard 4a) as Alternatives 1 and 2: one elk herd unit (Jericho EHU) would comply, the other five would not.

Applying the amended security area standard, Alternative 3 would provide the most security of any alternative, expanding security areas from the current 76,370 acres to 88,052 acres. This would be an increase from 33% to 38% of the hunting season elk range. The most substantial gains would come in the Greenhorn EHU, which would increase from 16 % to 34%, as a result of road closures around Greenhorn Mountain and in upper Little Porcupine Creek, elimination of a motor trail between Austin and Priest Pass, and, most of all, from the closure of the Sweeny Creek – Blue Cloud primitive road/trail system to motorized use. The Little Prickly Pear–Ophir, Spotted Dog–Little Blackfoot, and Jericho EHUs would also see increases in fall security, though to a lesser extent. In the Spotted Dog EHU, gains would result from road and motor trail closures on Baldy Ridge, in upper Spotted Dog Creek, and at the end of the Kading Road, as well as more effective closure of the Slate Lake road/trail system. This would allow an isolated security area on Baldy Ridge to expand southward to merge with the large Electric Peak Roadless Area. As in all action alternatives, security would remain unchanged in the Black Mountain–Brooklyn Bridge and Quartz EHUs.

As under current conditions, MFWP objectives for elk populations would continue to be met in three of the 4 hunting districts that cover Divide elk herd units (HD 215, HD 335, HD 343). While the Little Prickly Pear – Ophir EHU does not quite meet the 30% security area objective, MFWP elk population objectives would be met in the southern half of HD 293, which covers this herd unit. The northern half of HD 293 in the Big Blackfoot Valley and the Lincoln Ranger District is below population objectives because of predation problems unrelated to security on the National Forest (see "*Hunting Districts"*).

Alternative 4

Alternative 4 would produce the same pattern of *Forest Plan* compliance with the current Big Game security index (*HFP* Standard 4a) as Alternatives 1, 2, and 3: one elk herd unit (Jericho EHU) would comply with the standard, the other five would not.

Under the amended elk security area standard, Alternative 4 would be much the same as in Alternative 3. A minor difference would be a slight reduction in security area size in the Little Prickly Pear–Ophir EHU (110 acres) resulting from a motor trail (#136-007), open yearlong, just north of Meyers Hill. Alternative 4 would add other open roads and motor trails to the Alternative 3 scenario, but all would be closed for the big game rifle season and thus would not affect hunting season security for elk (though they would lower habitat effectiveness in summer: see Table 3.61).

Application of the Security Area Standard

As can be seen in Tables 3.63 and 3.64, elk security areas provide a means of gauging elk vulnerability/ security that is sensitive to changes in open road configuration. This allows a more realistic assessment as to potential impacts of travel management proposals in different herd units than the previous HFP Standard (the hiding cover/ road density index), which shows no difference between any of the alternatives. The difference between the two methods results largely from eliminating hiding cover as a primary determinant of elk security and focusing on the size and distribution of large habitat blocks to which hunter access is limited. This is particularly appropriate in this case, as Divide travel plan alternatives deal with changes in open road patterns and have no impact on *Forest Plan* hiding cover.

Hiding cover is still taken into account in delineating security areas, but it is seldom the make-or-break factor that it has become under the current standard (the road density/hiding cover index).

The key relationship in Table 3.64 is the degree to which security approaches or exceeds the 30% threshold. Table 3.64 shows that under Alternative 2, four herd units would be above the 30% level and two below. Security would increase in two herd units, decline in two, and remain steady in two others (using "adjusted" security areas). Under Alternatives 3 and 4, five herd units would be above the 30% security level. Of these, the Greenhorn EHU would see a substantial improvement in security and the Spotted Dog–Little Blackfoot and Jericho EHUs would see a more modest increment. As in Alternative 2, security would hold steady in the Quartz and Black Mountain–Brooklyn Bridge EHUs (much of which lie outside the travel planning area). Security in the Little Prickly Pear-Ophir EHU would increase from current levels (24%) but would remain just under 30%.

Table 3.64, below, shows how the security area standard would be applied—using not only the 30% threshold, but also the security trend in the herd unit and the status of elk population in the surrounding hunting district—or in that portion of the hunting district within the range of influence of the Divide travel planning area (see the previous discussion of "*Hunting Districts")*.

Application of the new standard serves to differentiate Alternative 2 from Alternatives 3 and 4. In Alternative 2, two herd units (Jericho and Spotted Dog – Little Blackfoot) would actually decline in percent security area, and the Jericho EHU, which starts out just below the 30% benchmark, would fall out of compliance with the standard. The Spotted Dog – Little Blackfoot EHU would continue to comply with the standard as percent security would remain well above 30%. The current *Forest Plan* standard is not capable of detecting these differences.

Table 3.65 Criteria for compliance of Divide landscape elk herd units with the amended *Forest Plan* standard for elk security [using "adjusted" elk security areas].

	Security Status of Elk Herd Unit (EHU)		**Status of Elk Population Objectives in Associated Hunting Districts**			
Elk Herd Units by Alternative	**% Security**	**Security Trend**	**Meets Objective for Elk Numbers?**	**Meets Obj. for Bull:Cow Ratio?**	**Issues with Obj. are Primarily Habitat-Related?**	**EHU meets HFP Standard?**
Alternative 1						
Little Prickly Pear - Ophir	24 %	static	yes/no *	yes/no *	no	yes
Greenhorn	16 %	static	yes/no *	yes/no *	no	yes
Spotted Dog – Little Blackft	45 %	static	yes	yes	n/a	yes
Jericho	30 %	static	yes	yes	n/a	yes
Black Mtn – Brooklyn Bridge	39 %	static	yes	yes	n/a	yes
Quartz	31 %	static	yes	yes	n/a	yes
Alternative 2						

	Security Status of Elk Herd Unit (EHU)		Status of Elk Population Objectives in Associated Hunting Districts			
Elk Herd Units by Alternative	**% Security**	**Security Trend**	**Meets Objective for Elk Numbers?**	**Meets Obj. for Bull:Cow Ratio?**	**Issues with Obj. are Primarily Habitat-Related?**	**EHU meets HFP Standard?**
Little Prickly Pear - Ophir	29 %	+ 5 %	yes/no *	yes/no *	no	yes
Greenhorn	33 %	+ 17 %	yes/no *	yes/no *	no	yes
Spotted Dog – Little Blackft	43 %	- 2 %	yes	yes	n/a	yes
Jericho	22 %	- 8 %	yes	yes	n/a	no
Black Mtn – Brooklyn Bridge	39 %	static	yes	yes	n/a	yes
Quartz	31 %	static	yes	yes	n/a	yes
Alternative 3						
Little Prickly Pear - Ophir	29 %	+ 5 %	yes/no *	yes/no *	no	yes
Greenhorn	34 %	+ 18 %	yes/no *	yes/no *	no	yes
Spotted Dog – Little Blackft	52 %	+ 7 %	yes	yes	n/a	yes
Jericho	32 %	+ 2 %	yes	yes	n/a	yes
Black Mtn – Brooklyn Bridge	39 %	static	yes	yes	n/a	yes
Quartz	31 %	static	yes	yes	n/a	yes
Alternative 4						
Little Prickly Pear - Ophir	29 %	+ 5 %	yes/no *	yes/no *	no	yes
Greenhorn	37 %	+21 %	yes/no *	yes/no *	no	yes
Spotted Dog – Little Blackft	50 %	+ 5 %	yes	yes	n/a	yes
Jericho	32 %	+ 2 %	yes	yes	n/a	yes
Black Mtn – Brooklyn Bridge	39 %	static	yes	yes	n/a	yes
Quartz	31 %	static	yes	yes	n/a	yes

* Herd units are split between 2 hunting districts—one of which meets all key MFWP big game objectives, the other of which does not.

The only herd unit in which security would remain below 30% for all three action alternatives is the Little Prickly Pear–Ophir EHU, which would be at 29% in all three cases. Because this represents an increase over the existing condition (24%), all three action alternatives would comply with the standard. This herd unit is split between 2 hunting districts: HD 293 west of the Divide and HD 343 east of the Divide. The eastern half of the unit—covered by HD 343—is outside the Divide travel planning area. Elk security there is relatively high because of the presence of large unroaded areas in the upper Little Prickly Pear drainage. MFWP population objectives for elk are currently being met in HD 343 (MFWP *Post-season Survey of Elk Hunting District 343,* 2011) .

West of the Divide, the northern half of HD 293 (centered on the Big Blackfoot Valley) is currently experiencing problems with low elk calf survival and declining population. These trends are related primarily to high levels of predation (bears, lions, wolves) and do not appear to be a function of inadequate habitat security on surrounding National Forests lands (the Lincoln Ranger District). Elk populations in the southern half of the HD 293—the area associated with the Divide travel planning area—remain in line with MFWP objectives. Natural predation is substantially lower than to the north and security is apparently sufficient to keep elk population size and structure on a relatively even keel (see *Hunting District 293)*.

The upshot is that elk security in the Little Prickly Pear–Ophir EHU, though a bit under 30%, would increase under all action alternatives and would improve the prospects of MFWP population objectives consistently being met in the portion of the hunting district that is influenced by this herd unit.

The one instance in which the new standard is *not* met is in the Jericho EHU under Alternative 2. This alternative would open up the currently-closed Flume–Mike Renig Gulch road system during the hunting season, eliminating over 2,000 acres of elk security area and dropping percent security in the herd unit from 30% to 22%.

In the Plan Area as a whole, proposed hunting season road closures would keep the percentage of elk security areas above the recommended 30% level (up from the current 33% to 38% in Alternatives 3 and 4). These changes demonstrate measurable benefits to elk security.

Winter Range

Rationale for Management

Winter range can be a key limiting factor for elk (and all ungulates). Wintering areas with minimal human activity and adequate forage help minimize the energetic costs associated with over-winter survival. As discussed earlier, much of the elk winter range in the Divide landscape is on private, State, and BLM lands outside the HNF boundary and beyond the reach of the Forest winter road and trail system. In many cases, elk choose to spend much of the winter on private ranch and agricultural lands, rather than on Forest grasslands in the foothills—even when they are readily available and stocked with abundant palatable forage.

While winter recreationists on foot (cross-country skiers, snowshoers) can disturb elk on winter habitat, few local winter ranges see this kind of activity (most of which occurs at higher elevaton). Winter ranges for HNF elk are subject primarily to disturbance from snowmobiles, wheeled vehicles (ATVs, 4wd rigs, cars and trucks on roads), and a variety of activities associated with ranching operations and, in some cases, subdivisions. Depending on the intensity, frequency, and predictability of the disturbance, elk reactions could involve an increase in general alertness, a slow retreating movement, or outright flight (Canfield *et. al.* 1999). A steady stream of disturbance, particularly in severe winters, has potential to increase mortality on winter and spring ranges and to lower reproductive success (Skovlin *et al.* 2002).

Helena Forest Plan Winter Range Standards

The *Helena Forest Plan* aims to limit vehicle use on winter range to established routes that provide access to other parts of the Forest or to adjacent private lands (Big Game Standard 4c). These travel restrictions are intended to prevent disturbance and harassment of elk and other big game animals during a period when physical stress is already high. Most, though not all, existing routes on winter range meet this standard. Alternatives 2, 3, and 4 propose new restrictions for motorized recreation on winter range via new snowmobile area closures and seasonal closure of some motorized recreational trails. None of the travel plan alternatives would allow new motor routes on elk winter range. In a number of cases, the classification of snowmobile routes would change—not to allow a new use, but to more accurately describe existing snowmobile routes where no conflicts with wildlife or other resources have arisen. In cases where a winter range conflict has become apparent (lower Sweeny Creek, Mike Renig Gulch), action alternatives propose closing existing snowmobile access.

The *Forest Plan* standard to maintain at least 25% of winter range in thermal cover (Big Game Standard 3) is not now being met on any of the five Divide elk herd units that contain winter range. In the Divide landscape, most of the winter range used by elk in all but the mildest of winters is on private and public land beyond the National Forest boundary. Field observation across this off-Forest region, along with perusal of aerial photos, reveals that thermal cover is well below 25% on these winter ranges as well. Be that as it may, recent MFWP surveys of big game winter ranges in the Divide landscape and adjacent foothills and valley lands suggest that elk and deer populations are suffering no ill effects from the dearth of classic thermal cover. Both species make frequent use of mature/pole timber on winter range, although most of these stands are not dense enough to provide the 70% canopy closure required of true thermal cover.

In the end, this is a moot point with regard to Divide travel plan proposals since none of the alternatives would have any effect on big game thermal cover: Its status would be the same in all herd units under all alternatives.

The *Helena Forest Plan* measures impacts on elk winter range in terms of (1) the acreage and dispersion of thermal cover and (2) the location of motorized routes. Thermal cover does not figure into the current analysis: None of the travel plan alternatives would affect it. But, changes in the classification of snowmobile routes and open roads that can be driven during winter are of interest. The *Forest Plan* allows for designated routes through winter range on HNF lands in order to facilitate land management, allow access to private land, or to provide routes to public recreation opportunities (most often, snowmobiling) in other areas (*HFP,* p. II/17-18). The greater the miles of roads, motor trails, and snowmobile routes accessible to vehicles on winter range the greater the potential for disturbance and displacement of elk.

In general, *Forest Plan* winter range—as mapped during development of the *Forest Plan* in the 1980s—is quite restrictive, focusing on areas consistently used by most elk in most winters. In the Divide landscape, relatively little of that winter range falls on HNF land so as to be affected by the Forest road system. A more expansive mapping of winter range was developed for the HNF Oil and Gas Leasing EIS in 1995 (USDA, USDI 1995). The map was based on assessments by MFWP and HNF biologists as to what sites big game animals might occupy under a wider variety of winter conditions than contemplated by the *Forest Plan.* As with *Forest Plan* winter range, "Oil and Gas" winter range is mapped only for areas within HNF boundaries.

More recently, Montana Fish, Wildlife and Parks (MFWP) [with assistance from the Rocky Mountain Elk Foundation (RMEF)] has constructed a broadscale (Statewide) planning map of elk seasonal ranges that has adopted an even more expansive version of potential winter range—one that incorporates considerably more land on the HNF than does the Oil and Gas EIS map. The "MFWP map" covers both HNF and private land, and its winter ranges extend well out into the Helena and Little Blackfoot valleys.

The initial version of the map came out in 1999, and a second version (delineating even more winter range) in 2004. A third version—developed by MFWP between 2008 and 2010—has adopted a new definition of winter range ("areas where populations....tend to concentrate during the winter season, commonly December through April"), eliminated some of the winter range mapped by the previous two editions, and omitted mapping of "crucial winter range". As with previous versions, the new maps are "appropriate for general planning purposes or broad landscape review…" The data are "not intended for planning and/or review of site-specific activities" (MFWP 2011). Because of these broadscale objectives, winter range boundaries are drawn along section lines rather than along local topographic or vegetative features, and are therefore less precise.

One of the challenges with the MFWP map for *Forest Plan* purposes has been the inclusion of broad areas into which small numbers of elk occasionally range during mild winters or through which they pass in late April on their way to summer range. While these sites have been used by elk in this way over the past 30 years, they do not represent areas where populations "tend to concentrate during the winter". The inclusion of these areas of *extended winter range* is useful in that it highlights areas where segments of the elk population may be vulnerable to human interference under mild winter conditions and as they move across transitional range toward summer range late in the season. But it does not contribute to an accurate delineation of true winter range—which is the area addressed by *HFP* standards.

The following process was used when determining what constitutes elk winter range for purposes of applying *HFP* standards and guidelines:

On a GIS map of the Divide landscape showing both the HNF Oil and Gas EIS winter range (1995) and MFWP extended winter range (2010), the location of several thousand "winter" elk locations (December 1 – April 30) was plotted. Locations were derived both from tracking of radio-collared elk (1983-1987) and from annual MFWP aerial winter range surveys (2000-2010). Elk locations were then tallied within HNF boundaries for (1) the "HNF Oil and Gas winter range" and (2) those found only on "MFWP extended winter range" beyond the "Oil and Gas" range. The comparison was confined to HNF lands, since this is the area that would be affected by travel plan alternatives.

Results were as follows:

- Total winter elk locations tallied: 7,856
- Locations within HNF administrative boundaries: 1,149
- HNF locations on Oil and Gas EIS winter range: 1,102 (95.9% of HNF locations)
- HNF locations only on MFWP extended winter range: 32 (2.8% of HNF locations)
- HNF locations not on winter range: 15 (1.3% of HNF locations)

Because HNF Oil and Gas EIS winter range accounts for nearly 96% of the winter elk locations/ observations and includes all of the sites where elk have been observed to concentrate for most of the winter, it is concluded that this delineation is appropriate for assessing potential effects of the Divide travel plan on the National Forest.

Even with the "Oil and Gas" delineation, a few problem areas remain with regard to *Forest Plan* standards. These involve snowmobile routes that have been in place for several decades and that, until 1995, were not considered to be on big game winter range. The greatly expanded delineation of winter range in the Oil and Gas EIS brought portions of these trail systems into the area covered by *HFP* standard 4c. This standard states that "all winter range areas will be closed to vehicles between December 1 and May 15," with the exception of access routes to "other lands" (*HFP,* p. II/18).

For the most part, the HNF has allowed snowmobile use to continue on these traditional trail networks—the assumption being that as long as the snow base in any given area remains substantial enough to

support recreational snowmobiling, it will not be suitable for use by big game animals. Once the snow deteriorates to the point that elk would be unable to move through it without difficulty and get down to ground forage, it would no longer be suitable for snowmobiles. In either situation, there would be no conflict.

Field observation over several decades validates the assumptions as to the temporal separation of elk and snowmobiles on winter range—with a few exceptions. These have occured in areas where newer model snowmobiles, able to deal with shallow, patchy snow, have been used to access antler hunting grounds in April. These incursions onto occupied winter/transitional ranges involve extensive off-trail riding, and most of the areas where these problems have arisen are covered by a variety of snowmobile area closures proposed in different alternatives.

Table 3.66 shows areas closed to snowmobiles under the four travel plan alternatives. Neither cross-country nor road/trail snowmobiling is allowed in these areas. Rationale for excluding snowmobiles include minimizing disturbance of big game animals on winter and spring ranges and deterring the use of snowmobiles for hunting. In addition, some closures help minimize disturbance of lynx, protect potential wolverine denning habitat, and alleviate conflicts between motorized and non-motorized recreation (primarily cross-country skiing and snowshoeing).

Table 3.66 Snowmobile area closures under the 4 alternatives

Area	Situated on Winter Range?	Acres Closed to Snowmobiles			
		Alt. 1	Alt. 2	Alt. 3	Alt. 4
Baldy Ridge	no	6,940	-	-	
Little Blackfoot Headwaters	no	19,150	19,150	19,150	19,150
MacDonald Pass Ski Area	no	920	920	920	920
Black Mtn (south) – Mt Helena	mostly	12,200	12,200	12,200	12,200
Hahn Creek – Mike Renig Gulch	entirely	-	1,200	1,200	1,200
Walker Crk – Bear Gulch Addition	entirely	-	4,250	4,250	4,250
Mike Renig–Tenmile Connection	no	-	-	2,900	2,900
Sweeny–Blue Cloud Creeks	entirely	-	6,130	6,130	6,130
Threemile–Ophir–Snowshoe Creeks	entirely	-	2,960	2,960	2,960
Black Mtn (north) – Deadman Creek	slightly	0	0	9,320	0
Total Closures		**39,210**	**46,810**	**59,030**	**49,710**

Alternative 1, No Action

Of the four current snowmobile area closures (Little Blackfoot headwaters, MacDonald Pass, Black Mountain–Mt Helena, Baldy Ridge), only the Black Mountain–Mt Helena closure incorporates HNF (Oil and Gas EIS) elk winter range. This latter closure discourages snowmobile-based antler hunting on late winter and transitional ranges and reduces potential harassment of elk (particularly bulls) in these areas. In addition, it compliments winter range area closures recently esablished in the adjacent Clancy-

Unionville Travel Plan area to the south and east. Snowmobile area closures on big game winter range total about 10,950 acres.

Under Alternative 1, 39 miles of regularly-used snowmobile routes impinge on HNF winter range, most of them in the upper reaches of the range where snow conditions are most conducive to snowmobile use. Few elk and deer venture into these areas in most winters, and no conflicts have been reported on the trail system. Almost 75% of winter range snowmobile routes occur on the east side of the Continental Divide north of U.S. Highway 12—that is, in the Sweeny Creek, Austin Creek, Greenhorn Creek, and Skelly Gulch drainages. Other areas with trails are along the western Forest boundary in the Threemile-Ophir–Snowshoe Creek area and south of Highway 12 in Hahn Creek and Mike Renig Gulch. Of the existing snowmobile routes, 16 miles are specifically designated as snowmobile trails, 20 miles are on roads open year-round to all vehicles able to navigate them, and four miles are on roads technically closed to all vehicles but on which the HNF has allowed snowmobile use for several decades. Some of these winter ranges are also traversed by roads leading to areas where resource management, public recreation, or private land require access, and vehicle use is thus permitted under *Forest Plan* Big Game standard 4c (*HFP,* p. II/18).

Alternative 2

Alternative 2 would appreciably expand snowmobile area closures on winter range. Most notable would be the 6,130 acre area immediately northeast of Sweeny Creek—a key wintering area for elk, moose, and deer. This area is now open to all vehicles in winter, and while it normally sees little snowmobile use, it is often accessible to ATVs and 4wd vehicles because of its low elevation and lesser snow accumulation. Other new closures include the fringe of elk winter range along the HNF border in the Threemile, Ophir, and Snowshoe Creek drainages; a patch of winter range in upper Mike Renig Gulch and Hahn Creek; and an extension of the Black Mountain–Mount Helena closure westward across the Tenmile drainage and northward into Walker Creek. New winter snowmobile closures would put an additonal 14,315 acres of HNF elk winter range off-limits to snowmobiles compared to current conditions.

Alternative 2 would reduce snowmobile trails on elk winter range from about 40 miles to 24 miles. Most of the reduction would come from closing the Sweeny Creek–Blue Cloud Creek area, including the trail system, to all vehicles between October 14 and May 16. The closure is intended to eliminate motorized disturbance on key big game winter range and on late fall and early spring transitional range—as well as during the hunting season. Of the remaining 24 miles of winter range snowmobile routes, 9 miles would be specifically designated for snowmobiles and 15 miles would involve roads open to all vehicles, including snowmobiles (although, with few exceptions, only snowmobiles are able to negotiate these routes in winter). Under Alternative 2, the curent policy of tolerating snowmobiles on certain roads that are technically closed to them would cease. Alternative 2 would leave open to all vehicles the current array of “crossing routes” that provide winter access to other parts of the Forest.

Alternative 3

Alternative 3 would close an additional 12,220 acres to snowmobile use (compared to Alternative 2)—2,920 acres along the Continental Divide between Tenmile Creek and Mike Renig Gulch and 9,320 acres in the northern end of the Plan Area around Black Mountain and the northern tributaries of Deadman Creek. Only a small sliver of this area (about 250 acres southwest of Black Mountain) is on winter range, however. With regard to snowmobile closures on winter range, Alternatives 2 and 3 are nearly identical.

Alternative 3 is identical to Alternative 2 in terms of snowmobile routes on winter range: that is, 9 miles of designated snowmobile trails; 15 miles of roads open to all vehicles able to negotiate them (in most cases, only snowmobiles); and no sanctioning of snowmobile use on road systems closed to all vehicles year-round. As with Alternative 2, the route and area closure in the Sweeny Creek–Blue Cloud Creek area would represent the most important removal of motorized disturbance from actively-used winter range.

Other trails remaining open are on higher elevation"winter range" in areas not used by big game animals until after snowmobile use has ceased. "Crossing routes" that allow motor vehicles to pass through winter range to access other parts of the Forest would be the same as in Alternatives 1 and 2.

Alternative 4

Alternative 4 is identical to Alternative 3 in terms of (1) Forest roads and trails open to snowmobiles on winter range (24 miles) and (2) "crossing roads" open to wheeled vehicles and snowmobiles on winter range. It includes 250 fewer acres of snowmobile closures on winter range since it does not include the 9,320 acre Black Mountain-Deadman Creek area closure.

Cumulative Effects

This summary of cumulative effects is based on the table appendix, which identifies past, present, and reasonably foreseeable actions and circumstances that may affect elk and elk habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings), adjacent National Forest lands (the Lincoln Ranger District of the HNF and the Jefferson Ranger District of the Beaverhead-Deerlodge NF), and neighboring non-Forest lands (private, State, County, municipal, and BLM). This summary is common to all alternatives.

Forest Service Past and Ongoing Activities

Recent and continuing activities on the HNF that have improved prospects for big game species include: Implementation of the Statewide OHV Plan (USDA, USDI 2001), which prohibits riding off established motor routes; a variety of trail relocation projects that have removed trails from productive riparian areas to upslope locations; mine reclamation projects that have improved the functioning of riparian habitats likely to attract these animals; grazing allotment revisions that have generally reduced cattle numbers and improved habitat condition; road and motor trail closures associated with timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Lava Mountain, Treasure Mountain); and ongoing noxious weed treatments.

Other activities have locally displaced elk, reduced the effectiveness of elk habitat, or have had a mixed effect. These include: timber harvest that has created an abundance of large clearcuts (Bison Creek, Mike Renig-Hahn Creek, Slate Creek, Lump Gulch, Ophir Creek-Cave Gulch, Deadman); numerous road permits allowing access across HNF land to private holdings; retention of private recreational residences on HNF land (particularly those at MacDonald Pass, less so those in Tenmile drainage); small mining operations (under the 1872 Mining Act); construction and maintenance of communications sites and power lines; Forest road improvement projects that have widened road corridors; and widespread fencing associated with grazing allotments that may complicate movement, especially for young animals.

The Forest has also undertaken several vegetation projects unlikely to affect elk because they are highly localized or situated close to human development. These include hazard tree removal in developed recreation sites, at administrative sites, and along road corridors.

Adjacent Private and Other, Past and Ongoing Actions

Private land development (primarily rural home building) is continuing to create sites that create problems for animals attempting to move through and occupy the landscape. Other endeavors with similar effects include mining operations (Drumlummon mine, Bald Butte mine clean-up), ATV-trail bike riding areas, private timber harvest, clearing vegetative cover from riparian sites, and new and upgraded roads (particularly improvements to the Marysville road).

Recent acquisition by the State of Montana of 27,000 acres of private land centered in the Spotted Dog Creek drainage immediately west of the HNF boundary has implications for elk security. These holdings were previously off-limits to most public hunting and have, in recent years, served as a refuge for elk during the hunting season. These lands are now open to public hunting (as of Sept. 2010) and to other

uses throughout the rest of the year—mostly hiking, wildlife watching, mountain biking, and horseback riding. Motorized access is limited. Other restrictions will be designed to protect elk on winter range, since these formerly private lands have served as primary winter habitat for elk for several decades. Public use of these lands may alter elk movement and use patterns on State, private, and adjacent HNF lands in the near future—although limited motorized access is likely to ameliorate elk vulnerability to hunting.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect elk to one degree or another include improvement of the Rimini Road, large vegetation manipulation projects (Red Mountain Flume-Chessman Reservoir, Telegraph salvage and thinning), and revision of several grazing allotments (MacDonald Pass, Austin, Empire, and several others).

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that may affect elk and other big game species includes: settlement and associated development of private lands (including road building); timber harvest and removal of beetle-killed dead trees; continued mining operations that usurp habitat and create disturbance zones (most notably, the Montana Tunnels mine expansion); continued ATV and other motorized activity.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*. No alternative would create circumstances that would measurably shift elk population size or population structure. The three action alternatives, however, would incrementally alter big game security and habitat effectiveness in local areas—thus altering elk habitat use patterns and hunter opportunity.

Elk Summer Range Habitat Effectiveness

Hiding cover on summer range—the Forest Plan measure of summer habitat quality—would remain the same under all alternatives. Habitat effectiveness, however, is a function of open road density and would vary among alternatives.

Alternative 1 would retain summer habitat effectiveness (HE) at 73% of the Divide landscape as a whole. HE would remain above the recommended 50% level in all six elk herd units (EHUs).

Under Alternative 2, habitat effectiveness would increase in 2 EHUs, decrease in one, and remain steady in three. Resulting HE in the landscape as a whole would remain at 73%.

Under Alternative 3, habitat effectiveness would increase in 3 EHUs and remain steady in three. Landscape-wide HE would increase to 74%.

Habitat effectiveness under Alternative 4 would be identical to that of Alternative 3 in five of the 6 EHUs. In one unit, however, (the Spotted Dog – Little Blackfoot EHU) habitat effectiveness would be 5% lower than in Alternative 3 because of routes in upper Spotted Dog Creek, on Baldy Ridge, and in upper Ontario Creek that would be open to wheeled vehicles in summer. Overall, HE would be 73% in Alternative 4—as in Alternatives 1 and 2.

In sum, habitat effectiveness would be similar in all four alternatives, and the overall availability of summer habitat would not be a limiting factor for elk under any alternative.

Elk Hunting Season Security

Under Alternative 1, effective elk security areas (adjusted for local conditions) would continue to occupy 33% of Helena NF fall (hunting season) home range in the Divide landscape. All four of the EHUs south of U.S. Highway 12, would continue to be at or to exceed the recommended minimum 30% of fall range; the

2 EHU's north of the highway would remain well below 30%. All EHUs would meet the *HFP* security standard, percent security would not decline in any unit, and MFWP objectives are being met.

Under Alternative 2, adjusted elk security areas would occupy 34% of Helena NF fall range. Security would rise in two EHUs, decrease in two, and remain steady in two. Four EHUs would exceed 30% security on Helena NF fall range; two would fall below 30%. Five EHUs would meet the *HFP* big game security standard; one (Jericho) would not.

Under Alternative 3, adjusted elk security areas would occupy 38% of Helena NF fall range. Security would increase in four EHUs and remain steady in two. Five EHUs would exceed 30% security on fall range, one (Little Prickly Pear–Ophir) would remain slightly below 30%. All EHUs would meet the *HFP* big game security standard.

Under Alternative 4, elk security areas would occupy 38% of the fall range—almost identical to Alternative 3, except for slightly more security in the Greenhorn EHU. As with Alternative 3, five EHUs would exceed 30% security and one would remain slightly below (Little Prickly Pear – Ophir EHU at 28.8%). All EHUs would meet the *HFP* big game security standard.

Current elk population numbers, bull/cow ratios, and calf/cow ratios are above MFWP objectives for three of the four hunting districts that cover the Divide landscape (HDs 215, 335, 343). In the 4th district (HD 293), total elk numbers are below MFWP objectives, but elk populations in the portion of the district influenced by the Divide travel planning area are at acceptable levels.

Winter Range

With regard to *Forest Plan* big game standard 3, no alternative would affect thermal cover on winter range. With regard to big game standard 4c, all alternatives would continue to allow the presence of some longstanding snowmobile routes on elk winter range. The three action alternatives are very similar: All would reduce snowmobile and OHV use on big game winter range—most importantly in the Sweeny–Blue Cloud Creek area.

Alternative 1 would retain approximately 10,950 acres of snowmobile area closures on HNF (Oil and Gas EIS) winter range. It would retain 39 miles of active snowmobile trails on winter range.

Alternative 2 would expand snowmobile area closures to cover approximately 25,490 acres of elk winter range and would reduce winter range snowmobile trails to 24 miles—most located toward the upper edge of winter range where elk seldom venture in winter.

Alternative 3 would provide the same snowmobile area closures and the same mileage of snowmobile trail on elk winter range as Alternative 2.

Alternative 4 would provide the same snowmobile area restrictions and the same array of snowmobile trails on elk winter range as Alternatives 2 and 3.

Forest Plan Consistency

Thermal and hiding cover habitat are not affected under any alternative.

Only one of 6 elk herd units currently complies with the *Forest Plan* Big Game Security Index. In spite of substantial open road closures in some elk herd units under all three action alternatives, compliance/non-compliance with the standard does not change in any case.

No new road closures specifically target elk calving areas, but some calving sites would benefit from the closures that focus on productive areas known to be important in multiple ways to big game. MFWP has not indicated a need for new closures to protect elk calving areas.

Roads designated as "crossing routes" through winter range to facilitate access to areas outside winter range would remain stable under all alternatives. A number of existing snowmobile routes intrude into the upper reaches of winter range: these routes would not increase under any alternative.

Threatened and Endangered Species

Grizzly Bear

Roads funnel human activity across the National Forest in ways that are known to diminish utility of otherwise suitable grizzly bear habitat. Travel management obviously has a key role to play in determining occupancy patterns for grizzlies on the landscape. This section describes potential effects in terms of road patterns in the Divide travel planning area. Grizzlies are scarce in the Divide landscape, but they continue to range southward out of solid populations in the NCDE Recovery Area to the north. The presence of non-motorized areas with a good dispersion of productive habitat is key to allowing bears to move through and occupy the landscape—albeit in small numbers.

Common Effects of Travel Management and Alternative Comparison

In this analysis, the potential effects of the four alternatives on grizzly bears are gauged in terms of (1) the size of unroaded core areas, (2) road density, and (3) motorized use in key habitat areas. Effective grizzly bear habitat requires sizable core areas free from motorized access during the period when bears are active (generally, April – November) (IGBC 1994). The analysis of large (>1,500 acres) non-motorized habitat patches in the previous Conectivity/Fragmentation section provides a basic summary of such areas in the travel planning area. A modified version more specific to grizzly bears is displayed below. Table 3.67 lists non-motorized core areas larger than 2,500 acres and at least 0.3 miles from open roads and motor trails (see USDA 2005, p. 7).

Table 3.67 Acreages of potential grizzly bear core areas (non-motorized habitat patches larger than 2,500 acres and at least 0.3 miles from open roads/trails) within the Divide Travel Plan Area.

Area Identification / Location	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Northern Distribution Zone				
Black Mountain	3,780			
Meyers Hill – Deadman Creek	2,808	9,666	9,666	9,531
Southern Distribution Zone				
Sweeny Creek – Austin Creek	2,673	3,591	5,400	5,400
Colorado Mountain – Black Mountain	10,260	10,260	10,260	10,260
Tenmile Creek – Bear Gulch	6,993	6,993	6,993	6,993
Treasure Mountain	2,970	[< 2,500]	3,375	3,294
Bison Mountain – Electric Peak	22,383	22,059		
Baldy Ridge	2,538	2,673	33,723	28,863
Spotted Dog Creek – Trout Creek	[< 2,500]	[< 2,500]		2,997
Slate Lake	[<2,500]	[< 2,500]	3,024	3,024

Area Identification / Location	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Total of Core Areas >2,500 acres	54,270	55,242	72,441	70,362

Table 3.68 summarizes the information from Table 3.67 in terms of the number and average size of secure core areas and the percent of the Travel Plan Area occupied by such habitat blocks.

Table 3.68 Summary of potential grizzly bear secure core areas

Area Identification / Location	Alt.1	Alt. 2	Alt. 3	Alt. 4
Northern Distribution Zone				
Number of Potential Core Areas	2	1	1	1
Average Core Area Size	3,294 ac	9,666 ac	9,666 ac	9,531 ac
Total Acreage in Core Areas	6,588 ac	9,666 ac	9,666 ac	9,531 ac
% of Distrib. Zone in Core Areas	13 %	19 %	19 %	19 %
Southern Distribution Zone				
Number of Potential Core Areas	6	5	6	7
Average Core Area Size	7,970 ac	9,115 ac	10,462 ac	8,690 ac
Total Acreage in Core Areas	47,682 ac	45,576 ac	62,775 ac	60,831 ac
% of non-Zone in Core Areas	38 %	36 %	50 %	48 %
Total Travel Plan Area				
Number of Potential Core Areas	8	6	7	8
Average Core Area Size	6,801 ac	9,207 ac	10,349 ac	8,795 ac
Total Acreage in Core Areas	54,270 ac	55,242 ac	72,441 ac	70,362 ac
% of Total Plan Area in Core Areas	31 %	31 %	41 %	40 %

The travel planning area currently supports 24 non-motorized habitat patches larger than 1,500 acres, as measured from roads' edge. However, the more stringent parameters applied to grizzly bear core habitat results in only 8 of these non-motorized blocks within the planning area. Secure core area characteristics (blocks of contiguous habitat at least 0.3 mile from motorized routes and larger than 2,500 acres) are based on recommendations of the Interagency Grizzly Bear Committee (IGBC 1994) and have been used in a number of recent analyses (see USDA 2005; Servheen *et al.* 2001). The core areas provide habitat that is less impacted by human activity and where gizzly bears are at lower risk of displacement and human-caused mortality (Servheen *et al.* 2001, p. 167).

In delineating core areas, several sizable blocks of unroaded habitat dropped below the 2,500 acre threshold when the 0.3 mile buffer was applied. These included non-motorized or lightly roaded roaded areas around Jericho Mountain, Red Mountain, Lee Mountain, Jerusha Gulch, Clarks Canyon, Little Porcupine Creek, LaSalle Gulch, and Greenhorn Mountain. Some areas, such as Jericho Mountain–Mike Renig Gulch, are gated to the general public, but allow limited motorized access for private landowners: Although motorized activity in such areas is slight, they were not included as part of grizzly bear core

habitat. While all of these areas provide suitable habitat components for bears—and in fact, grizzlies have been reported in some of them over the last 15 years—they are marginal as secure core habitat because of the greater potential for human intervention.

Some of the smaller blocks are tenuously connected to the larger core areas (listed in Table 3.67) by narrow corridors of unroaded habitat. The Jericho Mountain block (1,600-1,900 acres), for example, is connected over the Divide to the Tenmile–Bear Gulch core area by a 0.3 mile-wide corridor of non-motorized habitat. Likewise, the Slate Lake and Treasure Mountain blocks are both connected to larger core areas to the south by narrow necks of unroaded habitat.

On the other hand, some core areas, already extensive, connect with large roadless areas outside planning area boundaries. The Black Mountain core area, for example, abuts the large Nevada Mountain roadless area to the north. The adjacent Meyers Hill—Deadman Creek core area is also continuous with a large region of unroaded country in the upper Little Prickly Pear drainage, also to the north. In Alternatives 2, 3, and 4, these areas all combine into one large zone of non-motorized habitat covering over 45,000 acres. This, in fact, is the area in which the bulk of the grizzly bear activity in the Divide landscape has been observed. A similar situation occurs at the southern end of the travel planning area where the extensive Electric Peak–Bison Mountain core area is contiguous with roadless country on the Jefferson Ranger District of the Beaverhead-Deerlodge NF—a zone within which a majority of grizzly reports from the southern half of the landscape have occurred over the past 15 years.

Under Alternatives 2, 3, and 4, a small number of strategic road and motor trail closures in the northern Grizzly Bear Distribution Zone (north of Mullan Pass) allow consolidation of non-motorized blocks into a single core area of nearly 10,000 acres—the Black Mountain–Meyers Hill–Deadman Creek core area. This is the only part of the northern Distribution Zone in the travel planning area that provides viable core habitat. As mentioned above, this core area is contiguous with another extensive non-motorized region (roughly 35,000 acres) that abuts the travel planning area on the north—providing the Distribution Zone in the travel planning area with an effective linkage to established grizzly populations in the Blackfoot landscape on the Lincoln Ranger District.

In the new southern extension of the Distribution Zone, Alternatives 3 and 4 are more conducive to grizzly bears than Alternatives 1 and 2 in terms of the total acreage within secure of core areas (46,000-48,000 acres in Alternatives 1 and 2; 61,000-63,000 in Alternatives 3 and 4) [Table 3.68]. Differences relate primarily to effective motorized trail and road closures in the Treasure Mountain, Baldy Ridge, Slate Lake, and Sweeny Creek areas under Alternatives 3 and 4. In Alternative 2, core area acreage actually decreases from current conditions because of new motor routes in upper Ontario Creek and north and east of Treasure Mountain.

The density and distribution of roads and motor trails, public and private, are important in determining core areas and understanding the extent of habitat security for grizzly bears. Mace and Manley (1993) have found that in Montana adult bears use habitat with *open* road densities that exceed 1.0 mi/mi^2 less than would be expected (if habitat use were random). All sex and age classes use habitat with *total* road densities in excess of 2.0 mi/mi^2 less than expected.

Table 3.69 shows the kinds of open road and motor trail densities that grizzly bears would have to deal with in the Divide travel planning area under different alternatives. The volume and type of traffic these routes carry, and the resulting impact they have on grizzlies, varies widely within categories, and weighting factors have not been applied to the road mileages.

Table 3.69 Miles and and unweighted density (mi/mi^2) of roads and trails in the Travel Plan Area that are open to some kind of wheeled motor vehicle use during at least part of the year.

Motorized Route Miles / Density	Alt. 1	Alt. 2	Alt. 3	Alt. 4

Motorized Route Miles / Density	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Northern Distribution Zone				
Miles of HNF Open Roads	105	102	102	99
Miles of HNF Motor Trails	0	1	0	1
Miles of User-made Roads/Trails	13 *	0	0	0
Miles of County Open Roads	0	0	0	0
Miles of Private Roads	43	43	43	43
Total Open Route Miles	161	145	145	142
Total Open Route Density (mi/mi²)	2.6	2.4	2.3	2.3
Southern Distribution Zone				
Miles of HNF Open Roads	209	209	171	179
Miles of HNF Motor Trails	19	25	0	11
Miles of User-made Roads/Trails	7	0	0	0
Miles of County Open Roads	19	19	19	19
Miles of Private Open Roads	56	56	56.	56
Total Open Route Miles	310	309	246	265
Total Open Route Density (mi/mi²)	1.4	1.4	1.1	1.2
Total Travel Plan Area				
Miles of HNF Open Roads	314	311	273	278
Miles of HNF Motor Trails	19	26	0	12
Miles of User-made Roads/Trails	20	0	0	0
Miles of County Open Roads	19	19	19	19
Miles of Open Private Roads	99	99	99	99
Total Open Route Miles	471	455	391	408
Total Open Route Density (mi/mi²)	1.7	1.6	1.4	1.5

* User-made roads/trails for Alternative 1 include 3.3 miles of pioneered motor trail in the Black Mtn–Ophir Creek area not identified in the official tally of trail miles in the EIS.

Currently in the Divide travel planning area, *total* road density (including private roads) is about 2.1 mi/mi². Density is around 2.9 mi/mi² in the northern Grizzly Bear Distribution Zone and 1.7 mi/mi² in the southern Zone. Total road density is appreciably higher in the northern half of the Distribution Zone than in the southern half—a consequence of the large Inventoried Roadless Areas in the region south of Highway 12 outside the zone (Electric Peak, Lazyman, Jericho). Road densities in the northern Zone are well in excess of Mace and Manley's 2.0 mi/mi² total road benchmark; densities in the southern Zone are within the acceptable range below the threshold. In spite of this, grizzly bears continue to be encountered more frequently in the more more heavily roaded northern Zone than in the area to the south—apparently a function of the Zone's proximity to the NCDE. *Total* road densities (open and closed)

are the same for all alternatives—at least in the short term. Eventually, these densities could decline under action alternatives that recontour closed roads. *Open* route densities, on the other hand, are different for each alternative (Table 3.69). Mileages and densities include all routes within the travel planning area open to wheeled vehicles during at least part of the year: HNF roads, motor trails, County roads, and private roads (including those used by local land owners but not necessarily open to the general public).

Area-wide open route densities would be 1.7 mi/mi² in Alternative 1, 1.6 mi/mi² in Alternative 2, 1.4 mi/mi² in Alternative 3, and 1.47 mi/mi² in Alternative 4. All of these exceed the threshold of 1.0 mi/mi² that Mace and Manley's research suggests is likely to discourage grizzly bear use. Table 3.69 includes motor trails in addition to open roads, but the contribution of the trails is relatively minor (and in Alternative 3, non-existent), so this data is quite comparable to that of Mace and Manley. All three action alternatives reduce open route density by essentially the same amount inside the northern Distribution Zone—from the current 2.6 mi/mi² to 2.3-2.4 mi/mi². In the southern half of the Zone, Alternatives 3 and 4 lower open route density substantially more than does Alternative 2. Alternative 2 would be much the same as the existing condition.

The fact that grizzlies continue to move through and occupy parts of the travel planning area may reflect the rough, primitive condition of many Forest and private roads and the low levels of vehicle use they receive in summer—to the point that bears may often not perceive them as functioning roads. Be that as it may, all road densities under all alternatives far exceed levels recommended for and achieved by most Bear Management Subunits in the NCDE Recovery Zone on the Lincoln District to the north—areas in which the bears thrive (see USDA 2005).

Open roads and motor trails that penetrate *key* grizzly bear habitats may have an impact well beyond that indicated by unqualified road density and roadless patch size. Productive grizzly foraging sites are typically localized and fragmented, and they are often a limiting resource in any given landscape. Motor routes that compromise the functioning of these sites are of particular concern (see USDI 2006, p. 9, 18-19, 35-38; USDI 1993, p. 146).

A number of local areas that are treated differently under each travel plan alternative and that may be providing habitat for grizzly bears are discussed in some detail in the section on *Local Effects in Key Areas* (which follows toward the end of this report). Five of these areas are of particular interest because they support key grizzly bear habitat components and represent locations in which grizzly bears have been reported in the past 5 years. One of them—Black Mountain—is inside the original Grizzly Bear Distribution Zone north of Mullan Pass. The other four (Baldy Ridge, upper Telegraph Creek, Slate Lake–Slate Creek, and upper Ontario Creek–Bison Creek) are in the new southern extension of the Distribution Zone and south of Highway 12 where grizzly population density is very low.

As to Black Mountain, Alternatives 2, 3, and 4 eliminate user-made motorized routes into the otherwise unroaded area of forest habitat through which grizzly bears move between the Lincoln and Helena Ranger Districts. South of Highway 12, Alternative 2 increases motorized access (over present condition) into all four areas listed above. Alternatives 3 and 4 maintain the status quo or decrease motorized access, although Alternative 4 is less effective as it increases motorized access in upper Ontario Creek and maintains some of the current routes in the upper Spotted Dog–Baldy Ridge area. These areas, while further removed from the NCDE, have seen some grizzly bear activity (sparse though it may be) in recent years.

Alternative 1, No Action

Alternative 1 is the existing condition. As displayed in Table 3.69, open route densities in the travel planning area are well above the lower limits that research suggests cause grizzly bears to be reticent about using a particular area (greater than 1.0 mi/mi²). Current open road density (unweighted by use) is

2.6 mi/mi² in the region north and west of Mullan Pass and 1.4 mi/mi² elsewhere in the travel planning area.

The average size of the 21 non-motorized patches larger than 1,500-acres in the "*Connectivity/ Fragmentation"* analysis is 5,396 acres (Table 3.58). This compares with an average patch size of 6,801 acres for the 8 potential grizzly bear "core areas" larger than 2,500 acres and surrounded by an additional 0.3 mile non-motorized buffer zone (Table 3.68).[8] This average is considerably larger than the recommended 2,500 acres for such core areas [see USDA 2005]; but on the other hand, the core areas account for only 31% of the travel planning area (13% of the Distribution Zone and 38% of the area south of the Zone). By way of comparison, guidelines applied to Bear Management Units (BMUs) in the NCDE Recovery Zone to the north aim for a minimum of 68% of each Subunit in unroaded core areas.

Alternative 2

Alternative 2 reduces current open route density from 2.6 mi/mi² to 2.4 mi/mi² in the northern Distribution Zone. In the southern Distribution Zone, the reduction is minimal—with density remaining at about 1.4 mi/mi².

Alternative 2 slightly increases the total area in secure core areas from 54,270 acres to 55,242 acres. It considerably enlarges 2 secure core areas in the Black Mountain–Meyers Hill–Deadman Creek area in the northern Distribution Zone and merges them into a single unit (Table 3.67). It also slightly enlarges two existing core areas south of the Distribution Zone (Sweeny–Austin Creek and Baldy Ridge). At the same time, it reduces the size of core areas around Treasure Mountain and Bison Mountain, so that the acreage of core area habitat in the southern Distribution Zone would actually decline (from 47,682 acres to 45,576 acres). Overall, Alternative 2 would reduce the number of habitat blocks large enough to qualify as potential grizzly bear core areas from eight to six. Overall, grizzly bear core areas would occupy about 31% of the travel planning area under Alternative 2—much the same as Alternative 1.

In terms of motorized disturbance around key sites, Alernative 2 would increase motorized use in four areas: Baldy Ridge, upper Telegraph Creek, Slate Lake–Slate Creek, and upper Ontario Creek–Bison Creek (all in the southern half of the Distribution Zone). It would eliminate motorized intrusion in the Black Mountain area (inside the Distribution Zone at the northern end of the planning area).

Alternative 3

Alternative 3 would reduce open road density in the Distribution Zone from the current 2.6 mi/mi² to 2.3 mi/mi² (Table 3.69)—similar to Alternative 2. It would, however, do a better job in the area south of the Distribution Zone, dropping density from the current 1.4 mi/mi² to 1.1 mi/mi². Also like Alternative 2, Alternative 3 would create a unified 9,666-acre grizzly bear core area in the Black Mountain–Meyers Hill–Deadman Creek area along the nortern edge of the travel planning area. But unlike Alternative 2, which would actually reduce core area habitat in the southern half of the Distribution Zone, Alternative 3 would enlarge it substantially—from 47,682 acres to 62,775 acres (Table 3.68). This would result from expansion of non-motorized habitat blocks in the Sweeny–Austin Creek, Treasure Mountain, and Slate Lake areas and from enlargement and consolidation of three separate areas at the southern end of the Plan Area into a single 33,723-acre core area (Bison Mountain – Electric Peak – Spotted Dog Creek) [Table 3.67].

Alternative 3 would not increase motorized presence in any of the key areas likely to have been providing habitat for grizzlies in the last 5 years. It would decrease potential for such presence in three of these

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[8] Large non-motorized road patches used in the connectivity/fragmentation analysis are delineated from road's edge, whereas grizzly bear core areas require a buffer of 0.3 mi between the road and the core area.

areas. The resulting parameters, while well below what is required of a grizzly bear recovery zone, represent a measurable improvement over current conditions.

Alternative 4

Alternative 2, 3, and 4 all produce essentially the same open motor route density in the northern half of the grizzly bear Distribution Zone (2.31-2.35 mi/mi²). But in the southern zone, open route densities under Alternative 2 would be notably higher than under Alternative 3. Those produced under Alternative 4 (at 1.47 mi/mi²) would be partway between Alternatives 2 and 3 (see Table 3.67).

Alternative 4 would be similar to Alternative 3 with regard to the amount of habitat in non-motorized grizzly bear core areas: 9,531 acres in the northern Distribution Zone (as opposed to 9,666 acres in Alternative 3) and 60,831 acres in the area south of Mullan Pass (as opposed to 62,775 acres in Alternative 3) [Table 3.67].

In terms of motorized presence in key areas likely to have been providing habitat for grizzlies in recent years, Alternative 4 is less intrusive than Alternatives 1 and 2 but more so than Alternative 3. Like Alternative 2, Alternative 3 would establish a summertime motor trail on currently closed road #4104-A1 along upper Ontario and Bison Creeks—an area of excellent potential grizzly habitat, and within 2-3 miles of sites where grizzlies have been reported in the last five years. While not as disruptive as an arterial or collector road, the trail would introduce motorized disturbance into an environment potentially useful to grizzlies. Alternative 4 would not sanction motorized use in other key grizzly areas—and in this regard it is nearly identical to Alternative 3. This includes the consolidation and expansion of non-motorized core areas in the Black Mountain region along the northern edge of the Plan Area. In the end, Alternative 4 would maintain nearly 40% of the Plan Area as non-motorized core habitat—slightly less than Alternative 3 and appreciably more than Alternatives 1 and 2 (Table 3.68).

As with Alternative 3, the resulting conditions, while well below what is required of a grizzly bear recovery zone, represent a measurable improvement over current conditions.

Cumulative Effects

This summary of cumulative effects is based on the matrix in *Appendix B*, which identifies past, present, and reasonably foreseeable actions and circumstances, in addition to this project, that may affect grizzly bears and their habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings), adjacent National Forest lands (on the Lincoln Ranger District and the Beaverhead-Deerlodge NF), and neighboring non-Forest lands (private, State, County, municipal, and BLM). This summary is common to all alternatives.

Forest Service Past and Ongoing Activities

Recent/ongoing activities on the Forest that have improved prospects for grizzly bears include: designation of the NCDE Grizzly Bear Distribution Zone north of Mullan Pass (2002) and its recent expansion southward to cover the entire Divide landscape (2013); trail relocation projects that have removed trails from riparian areas to upslope locations (Blackfoot Meadows, CDNST); mine reclamation projects, some of which have improved riparian habitat function favorable to bears; establishment of the Statewide OHV Plan (2001), which prohibits riding off established motor routes; grazing allotment revisions that have often reduced cattle numbers and improved habitat; and road and motor trail closures associated with timber sales (Clancy-Unionville, Sound Wood, Treasure Mountain) that have enlarged non-motorized habitat blocks.

Activities that have locally reduced the effectiveness of potential grizzly habitat or have had a mixed effect include: timber harvest that has created large clearcuts—as opposed to a finer-grained habitat mosaic (Bison Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Lump Gulch, Ophir Creek-Cave Gulch, Mullan Pass, Lava Mtn, Deadman); road permits allowing access across HNF land to private holdings; retention of

private recreational residences on HNF land (esp. near the Divide at MacDonald Pass); small mining operations (under the 1872 Mining Act) in areas where grizzlies have been observed; construction and maintenance of communications sites and power lines; widespread fencing associated with grazing allotments that complicate movement; efforts to spread out livestock use on some allotments, which may bring cattle into new areas of potential grizzly habitat; retention of numerous dispersed camping sites; and unrestricted back-country recreational use (backpackers, day-hikers, horseback riders, hunters). Timber harvest is on-going in the Clancy-Unionville planning area, removing blocks of beetle-killed lodgepole pine in the upper Lump Gulch/ Travis Creek drainages. Recently, this activity has moved to the Brooklyn Bridge area in the form of thinning in mature Douglas-fir forest (as well as additional dead-tree harvest). Some recent hazard tree removal projects are unlikely to impact grizzly bears because of their association with roads and developed recreation sites (Park Lake and Cromwell Dixon Campgrounds, MacDonald Pass CDNST Trailhead).

A number of other projects designed to remove hazard trees are unlikely to influence grizzly bears because of their association with roads and developed recreation sites (Kading and Moose Creek campgrounds, Tenmile picnic area, Roadside Hazard Trees, MacDonald Pass Ski Trails).

Adjacent Private and Other, Past and Ongoing Actions

Private land development (mostly rural home building) continues to create sites that generate problems for animals striving to move through or occupy the landscape (barriers to movement, habitat loss, bear attractants, dogs). Other human endeavors with similar effects include mining operations, ATV-trail bike riding areas, new and upgraded roads (notably, the widening and paving of the Marysville road), unregulated private timber harvest, and clearing of vegetative cover from riparian sites. Livestock grazing on private lands near the Forest has some potential to create conflicts with bears under certain circumstances (sheep being particularly vulnerable). Recent purchase of 27,600 acres of private ranchland in the Spotted Dog drainage by MFWP will forstall subdivision and development of those lands immediately west of the HNF boundary and allow them to remain in a condition more amenable to grizzly bear habitation and passage.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect grizzlies to one degree or another include improvement of the Rimini Road (in a potential wildlife travel zone), implementation of grazing allotment revision (Clancy, MacDonald Pass, Austin, Empire), increased recreational use of back-country environments, and salvage projects designed to deal with the ongoing bark beetle epidemic (in particular, the Telegraph Creek project and Red Mountain Flume-Chessman Reservoir project).

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land in the cumulative effects area that may affect grizzly bears includes: settlement and associated development of private lands (including road building); timber harvest and removal of beetle-killed dead trees; andcontinued motorized recreation.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Alternative 1 would retain eight large non-motorized core habitat areas averaging roughly 6,800 acres each (31% of the Plan Area). Unweighted open motor route density would remain at 1.69 mi/mi².

Alternative 2 would reduce the number of large non-motorized core habitat areas to six—but their average size would increase to 9,207 acres (31% of the Plan Area). Unweighted open motor route density would decline slightly to 1.6 mi/mi².

Alternative 3 would support seven large non-motorized core habitat areas with an average size of 10,349 acres (41% of the Plan Area). Unweighted open motor route density would decline to 1.4 mi/mi².

Alternative 4 would support eight large non-motorized core habitat areas. Average size of these areas would be 8,795 acres (40% of the Plan Area). Unweighted open motor route density would be 1.4 mi/mi².

Under all alternatives, road/ motor trail densities in the travel planning area would remain high by Recovery Zone standards, but, coupled with several large non-motorized core areas, they are low enough to support a small local grizzly bear population and to support linkage zone function. No conflicts with livestock and no human-caused grizzly bear mortalities have been recorded in the Divide landscape in several decades.

All alternatives would comply with the *Grizzly Bear Recovery Plan*, the *IGBC Guidelines*, and with appropriate standards in the *Helena Forest Plan.*

Canada Lynx

Effects of travel management on lynx are assessed via standards and guidelines in the *Northern Rockies Lynx Management Direction(NRLMD)* (2007b, Attachment 1), which is now incorporated into the *Helena Forest Plan.* Since none of the alternatives propose new road construction or specific road improvements that would alter vegetation, direct effects on habitat are essentially non-existent for this particular phase of travel management. Primary effects, therefore would be those generated by shifts in open road distribution and in snowmobile routes that provide access for trappers and packed-over-snow travel routes into lynx winter habitat for competing carnivores. There is also some potential for motorized routes disrupting lynx movement patterns in linkage habitat. Potential effects on critical habitat are further evaluated in relation to "primary constituent elements" (PCEs) for lynx identified by the USFWS in documentation designating critical habitat in February 2009 (Federal Register, Vol. 74, No. 36, p. 8638).

Common Effects of Travel Management

General Effects of Open Roads

Useful information on the effects of roads and trails on lynx and their prey is meager (Apps 2000; McKelvey *et al.* 2000). Much of it is anecdotal, and studies that have specifically targeted road impacts have not produced definitive conclusions.

Construction of roads sometimes removes linear swaths of suitable lynx habitat, which may have a local impact if habitat is limiting or key sites are affected. Some researchers have noted that adult females may move kittens to new den sites to avoid nearby vehicle traffic that escalates as summer comes on (Ruggerio *et al*. 1999). In some cases, lynx may alter normal travel and hunting patterns to avoid open roads, but they are also likely to travel along roadways less than 50 feet wide with good cover along both edges (Koehler and Brittell 1990). Field research and observation indicate that in normal circumstances most lynx do not necessarily avoid habitat near roads except for roads with high traffic volume (Aubry *et al.* 1999; Ruggerio *et al*. 1999).

Lynx are particularly vulnerable to exploitation by trapping (Bailey *et al.* 1986). Although they can no longer be targeted by trappers in Montana, lynx are at risk from traps set for any mid-sized furbearer and therefore are affected by roads and snowmobile trails that provide access for trappers in winter. Research does indicate that lynx are probably more vulnerable to trapping near open roads (Koehler and Aubry 1994; Bailey *et al.* 1986).

Denning habitat is usually not a limiting factor for lynx in the northern Rockies (USDA 2007c, p. 173), and the *Lynx Management Direction* does not present a standard that specifies how much denning habitat needs to be retained in a given LAU (USDA 2007b, p. 14-17). However, Guideline VEG G11 states that substantial pockets of large woody debris should be distributed throughout each LAU and that if denning

habitat appears to be deficient, projects should be designed to retain coarse woody debris (USDA 2007b, Attachment 1, p. 5). The Divide travel plan does not propose to alter existing patterns of woody debris, but it would indirectly provide opportunities for firewood cutters to remove snags and logs from road corridors, which, in some cases, may degrade potential lynx denning habitat. Normally, areas within 300 ft of open roads are unlikely denning sites, but they could serve the purpose in certain circumstances, such as where understory regeneration is thick, downfall is abundant, traffic is infrequent, and opportunities are limited elsewhere.

Refuge and Connectivity

While it is not conclusively known what effect roads and motorized trails have on lynx, research suggests that local unroaded or non-motorized refuges are important for successful lynx reproduction and for ecological fitness (Ruediger *et al.* 2000). Such refugia include large areas of high quality habitat relatively secure from human exploitation, habitat degradation, and disruptive winter access. Landscape connectivity is also an important component of lynx conservation. Areas of high human use can interrupt habitat connectivity and further fragment lynx habitat (Ruediger *et al.* 2000).

Previous sections of this report dealing with *Fragmentation and Connectivity* and with the *Grizzly Bear* present assessments of large blocks of non-motorized habitat that may be of use to lynx as sanctuaries. These analyses show that the average size of potential lynx refuges increases substantially under Alternative 2 and more so under Alternatives 3 and 4.

Snow Compaction

Roads and trails provide unobstructed routes for snowmobiles, cross-country skiing, and other winter uses that create snow compaction. Compacted routes facilitate winter access for carnivores that would otherwise be unable to negotiate the deep snow characteristic of lynx winter habitat. Lynx have evolved a competitive advantage in deep, non-compacted snow that tends to exclude other predators during winter, a time when prey is most limiting (Buskirk *et al.* 1999; Ruediger *et al.* 2000). Competing carnivores that might be able to take advantage of solid over-the-snow routes include coyotes, bobcats, red foxes, mountain lions, wolves, and wolverines (although wolverines are also willing to move through deep loose snow on a regular basis). Although coyotes and bobcats are most often cited as the primary competing carnivores taking advantage of compacted snow routes, systematic tracking surveys in the Divide landscape (Wild Things Unlimited, 2007-2010) found,that the most fequently encountered winter competitors were coyotes and red foxes (see Gehman *et al.* 2008, 2009).

Research on this issue is new and, so far, conclusions have been limited. One study of the effect of snow compaction on coyotes and lynx in western Montana (Kolbe *et al.* 2005) found that while coyotes did use packed snowmobile and ski trails in lynx habitat, most of their travel was off-trail, often in areas where snow was shallow or naturally compacted. As well, coyotes acted primarily as scavengers in winter and did not compete substantially with lynx for live prey.

Another recent study in northern Utah (Bunnel 2006, cited in USDA 2007c) found that coyotes stayed relatively close to snowmobile trails (within 350 meters) when snow was deep and prey was common in the trail corridor. The sum of recently completed and ongoing research suggests that lynx and coyote populations often coexist on winter range but that there is no good evidence that lynx populations are suffering as a result (USDA 2007b, p. 24).

A number of studies have observed also that lynx normally tolerate at least moderate levels of snowmobile traffic through their winter habitats and that they readily use packed snowmobile routes as travelways (Aubry *et al.* 1999).

Effects Assessment: Comparison of Alternatives

Attachment 1 in the *Northern Rockies Lynx Management Direction ROD* (2007b) displays the objectives, standards, and guidelines designed to promote lynx conservation. *Objectives* are descriptions of desired resource conditions for lynx. *Standards* are management *requirements* designed to meet objectives. *Guidelines* are management actions that, while not required, are *normally taken* to meet objectives (USDA 2007b, p. 7). Standards and guidelines that deal with the potential effects of travel management on lynx can be found in *NRLMD* sections addressing "human use projects" (HU), "linkage areas" (LINK), and management applicable to all actions in LAUs (ALL).

Guidelines HU G6 and HU G8 deal with road upgrading and maintenance: They would apply to future road projects emanating from the Divide travel plan but not to this phase of the planning effort. Guidelines HU G7 and HU G9 address the placement, design, closure, and reclamation of *new* roads. Since no travel plan alternative proposes to construct new roads, this guidance does not apply—although it may be useful in assessing the closure of existing roads. The *NRLMD* does not provide standards or guidelines that address the density of open roads, motor trails, foot trails, or closed roads (see discussion in *NRLMD ROD,* p. 26-27).

Standard LINK S1 requires identification of potential lynx highway crossings when planning highway construction or reconstruction in known linkage areas. Likewise, Guideline ALL G1 directs the use of methods that avoid or reduce effects on lynx when constructing or reconstructing highways. Since none of the alternatives propose highway construction or reconstruction, this direction does not apply to the Divide travel plan. The problems that two these standards/guidelines address, however, are relevant in that (1) highway crossings are an existing problem on U.S. Highway 12 around MacDonald Pass and (2) two projects by other agencies that may qualify as "highway reconstruction" are within the cumulative effects area (the Marysville and Rimini Road projects). These circumstances do not influence the Divide travel plan's compliance with the *NRLMD,* but they are part of the environmental baseline that needs to accounted for.

This leaves Guidelines HU G11 and HU G12, which deal with over-the-snow routes and the issue of winter access into lynx habitat. These guidelines are as follows:

- HU G11. *Designated over-the-snow routes* or designated play areas should not expand outside baseline *areas of consistent snow compaction*, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis or for a combination of immediately adjacent LAUs.
- HU G12. Winter access for non-recreation special uses and mineral and energy exploration and development should be limited to designated routes or designated over-the-snow routes.

A breakdown of snowmobile routes in the Divide travel planning area is shown in Table 3.54. Currently, the planning area supports 88 miles of roads and trails that have been *specifically designated* for snowmobile use under the existing travel plan (see HNF Visitor Map, 2006; Divide Travel Plan map for Alternative 1). The travel plan also allows snowmobile use on any Forest or County road open to highway-legal vehicles, whether or not it is specifically designated as a snowmobile route, as long as the road is (1) unplowed and (2) not within an area closed to snowmobiles. Snowmobilers currently make use of 239 miles of these "allowed" routes—most of which have been in use for several decades (HNF Recreation files; Helena Snowdrifters Snowmobile Club meetings). Roughly 48% of the non-specified routes (114 miles) are shown on the map of *Snowmobile Routes on the Helena National Forest* (Helena Snowdrifters 2003). Alternatives 2, 3, and 4 would specifically designate many of these traditional routes as "snowmobile trails". This represents a shift in status from an *allowed* use to a *specifically designated*

use. It does *not,* however, represent an actual increase in the identified network of packed over-snow routes.

In addition to this system of routes on which snowmobile use is *specified* or *allowed* by the travel plan, a number of roads that technically are "closed to motorized vehicles yearlong" also have been serving as snowmobile trails for the past 2-3 decades. The reasons for the original route restrictions for snowmobiles (which date from the 1970s and 1980s) are unclear, particularly since the areas through which the roads travel are open to cross-country snowmobiling—which means that, in practice, snowmobilers have been permitted to ride *next to* or *between* the roads, but are technically forbidden to ride *on* the roads. In some cases, snowmobilers have established trails adjacent to the roadbeds, but in other cases they have been using the roads themselves.

For the most part, the HNF has allowed the unauthorized on-road use to continue in areas where no problems for wildlife or other recreational activity (notably, cross-country skiing and snowshoeing) have been evident. Alternatives 2, 3, and 4 would now legitimize the longstanding snowmobile use on a number of these restricted road systems—and allow the next-to-the-road and cross-country use to move onto the roads. The road systems to be thus designated have been chosen based on historic snowmobile use patterns and the absence of observed resource problems (supporting data coming from longtime field observations by HNF recreation personnel and discussions with the Helena Snowdrifters Snowmobile Club). Under all alternatives, wheeled vehicles would continue to be excluded year-round.

The change in designation would affect 36 miles of currently restricted roads in lynx habitat under Alternative 2 and 33 miles under Alternatives 3 and 4. Combined with new road/trail closures in other areas, the net increase of officially sanctioned snowmobile routes in lynx habitat would be 32 miles under Alternative 2 and 28 miles under Alternatives 3 and 4 (the breakdown by LAU is displayed in Table 3.70 below).

None of the action alternatives would produce an on-ground increase in established over-the-snow routes as per *NRLMD* Guideline HU G11 (refer to the bottom row of Table 3.54). That is, the area of snow compaction in lynx habitat would not increase under any of the action alternatives and would not be greater than the baseline level of snow compaction that was documented for the *Canada Lynx Conservation Assessment and Strategy (CLCAS)* in 1999-2000. The baseline snowmobile route mileage in the travel planning area is 425 miles, of which, 165 miles are in lynx habitat. This has not changed since 1999. Route miles in lynx habitat would decrease to 161 miles in Alternative 2, and to 159 miles in Alternatives 3 and 4. Table 3.70 shows the changes by LAU.

Table 3.70 Net change in miles of active snowmobile trail in lynx habitat under Divide Travel Plan alternatives. Changes are relative to the *CLCAS* "baseline condition" of 1999-2000.

Lynx Analysis Units	**Net Change from the 1999-2000 Baseline Condition in Miles of Active Snowmobile Routes in Lynx Habitat**			
(LAUs)	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
North of U.S. Highway 12				
di-01	0	0	-1	0
di-02	0	-2	-2	-2
South of U.S. Highway 12				
di-03	0	-1	-2	-2
di-04	0	-2	-2	-2

Lynx Analysis Units	Net Change from the 1999-2000 Baseline Condition in Miles of Active Snowmobile Routes in Lynx Habitat			
(LAUs)	Alt. 1	Alt. 2	Alt. 3	Alt. 4
di-05	0	0	0	0
di-06	0	0	0	0
Change North of Highway 12	0	-2	-3	-2
Change South of Highway 12	0	-3	-4	-4
Change in Total Plan Area	0	-5	-7	-6

The HNF has not designated off-route "play areas" for snowmobiles in the Divide landscape; but unless such riding is prohibited by specific area closures, it is allowed—and there is a general understanding as to where these traditional play areas are located. While in most cases, off-trail riding involves play areas near sanctioned trails, there is potential for pioneering routes off into new areas—which could extend the reach of competing carnivores. In the Divide landscape,most of this activity is confined to higher elevation meadows, parks, and other breaks in forest cover where snowmobiles have room to maneuver. As a result, almost none of it is in mapped lynx habitat (which is forested). No travel plan alternative designates specific play areas or makes changes to existing snowmobile routes that would encourage more off-route riding. To the contrary, Alternatives 2, 3, and 4 propose to expand the number and size of areas where off-route snowmobile riding is *restricted*. As a result, all 4 alternatives comply with the "play area" aspect of Guideline HU G11.

Table 3.71, below, summarizes acreages within each LAU closed to off-trail snowmobile riding under each alternative (see also alternative maps). Acres in Table 3.71 have been estimated from Divide travel plan alternative maps and rounded to the nearest 10 acres. The snowmobile closure in the MacDonald Pass cross-country ski area (920 acres) in di-05 has not been included since it contains numerous packed over-the-snow routes generated by trail grooming.

Table 3.71 Areas closed to off-route snowmobile riding within lynx analysis units (LAUs) in the Divide Travel Plan Area.

Alternatives	Snowmobile Closure Acres within Lynx Analysis Units					
	di-01	di-02	di-03	di-04	di-05	di-06
Alternative 1	0	0	15,280	3,870	6,370	5,830
Alternative 2	2,320	640	15,280	3,870	10,620	8,150
Alternative 3	11,640	640	15,280	6,640	11,950	8,150
Alternative 4	2,320	640	15,280	6,640	11,950	8,150

Alternative 1 would maintain about 31,350 acres of snowmobile area closures, of which roughly 70% are in potential lynx habitat. Alternative 2 would expand this to about 40,880 acres, of which about 77% are in lynx habitat. Alternative 3 would provide the largest snowmobile closure area—about 54,300 acres, with about 79% in lynx habitat. Alternative 4 would close about 44,980 acres, of which 78% are in lynx habitat. As displayed in the table, most area closures in the travel planning area are in LAUs di-03, di-04, di-05, and di-06, south of U.S. Highway 12. This is the part of the Divide landscape that the *NRLMD* classifies as "secondary" occupied lynx habitat—but it is the part of the landscape where most of the

verified lynx observations have been made in the last five years. The upshot is that these snowmobile restrictions are targeted at that portion of the travel planning area where they are most likely to benefit lynx as currently distributed, regardless of whether or not the area has been classified as critical lynx habitat.

As to Guideline HU G12, the travel plan does not address access for special uses or mineral/ energy exploration and development. The HNF deals with proposals for these activities via a special use permitting process. So, this guideline does not apply to travel plan proposals.

Effects Assessment: Critical Habitat

Effects on critical habitat are assessed in terms of the impact that each alternative has on the four primary constituent elements (PCEs) associated with "boreal forest landscapes" that are capable of supporting lynx (*Federal Register*, Vol. 74, No. 36, p. 8638). PCEs apply both to suitable (mapped) lynx habitat in the region north of U.S. Highway 12 and to "matrix habitat" that surrounds and connects areas of suitable habitat in that area. Characteristics of the various PCEs and potential effects of travel plan alternatives are as follows:

- **PCE (a).** "Preferred habitat conditions, which include dense understories of young trees, shrubs or, overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface".
- Effects: None of the proposed alternatives would have any effect this on this PCE because none of them propose to alter forest vegetation. Any indirect effects—such as might come from firewood cutting in open road corridors—would have no measurable effect on dense understory vegetation.
- **PCE (b).** "Winter snow conditions that are generally deep and fluffy for extended periods".
- Effects: Alternatives influence this element by allowing snow-compacting activity—primarily snowmobiling—in occupied winter lynx habitat. Alternative 1 would maintain all current sanctioned snowmobile routes. The three action alternatives would slightly reduce road and trail miles on which existing snowmobile use is sanctioned in critical lynx habitat (by 2 miles in Alternatives 2 and 4 and by 3 miles in Alternative 3).
- **PCE (c).** "Sites for denning that have abundant coarse woody debris, such as downed trees and root wads".
- Effects: Travel management affects this element indirectly by maintaining open roads in potential lynx habitat that allow firewood cutters to remove snags and woody debris that might, in some circumstances, contribute to lynx denning. Alternative 1 retains the status quo in this regard. Alternative 2 reduces open road mileage in critical lynx habitat by about 7% and Alternatives 3 and 4 reduce it by about 8%.
- **PCE (d).** "Matrix habitat (not supporting hares) that occurs between patches of boreal forest in close juxtaposition such that lynx are likely to travel though such habitat while accessing patches of boreal forest within a home range".
- Effects: None of the 4 alternatives would directly affect matrix habitat because none of them propose to alter vegetation or other habitat components. There would be no new road construction. Alternatives 2, 3, and 4 would reduce road density in matrix habitat in LAUs that support critical lynx habitat (LAUs di-01, di-02).

The effects generated by these alternatives would not result in "adverse modification" of critical lynx habitat. They would allow "the affected critical habitat to remain functional…to serve the intended conservation role for the species" (*Federal Register*, Vol.74, No. 36, p. 8644).

Alternative 1, No Action

Effects of Open Roads

Alternative 1 would maintain the status quo with regard to open roads and snowmobile routes that facilitate access for trappers and firewood cutters. The travel planning area currently supports 466 miles of roads and motor trails open at some time of the year. There have been no reports of lynx incidentally trapped in the Divide landscape in recent years, although they are known to inhabit the area year-round.

Refuge and Connectivity

Alternative 1 would retain the existing dispersion of potential lynx safe areas. Connectivity analysis indicates that there are currently 21 large non-motorized habitat blocks (>1,500 acres) in the travel planning area, averaging 5,396 acres in size (as measured from the edges of surrounding open routes) [Table 3.58]. Grizzly bear habitat analysis indicates that the travel planning area supports 8 areas larger than 2,500 acres with boundaries at least 0.3 miles from open routes. These areas average 6,801 acres (Table 3.68). The fact that lynx have been inhabitating the planning area consistently in recent years suggests that this is adequate—at least for a small population.

Snow Compaction

Alternative 1 would maintain existing condition: the travel planning area would continue to support 425 miles of active snowmobile routes, 348 miles of which are currently sanctioned by the existing travel plan and 77 miles of which are not. Roughly 170 miles of the active trails pass through mapped lynx habitat. Alternative 1 would comply with *NRLMD* Guideline HU G11 with regard to designated over-the-snow routes. No specific snowmobile play areas would be designated in this alternative, and all areas where off-route riding is currently restricted would continue to be closed to such use. With the exception of a small closure around the MacDonald Pass cross-country ski area, all snowmobile area closures are currently south of Highway 12 in LAUs di-03, 04, 05, and 06. Of these, two are winter closures applicable to lynx habitat: the Electric Peak and Lazyman Roadless Areas. Alternative 1 thus complies with the play area direction of *NRLMD* Guideline HU G11.

Alternative 2

Effects of Open Roads

Alternative 2 would reduce miles of open road and trail available to wheeled vehicles and to snowmobiles by about 12 miles (from 466 miles to 457 miles). Some of these closures apply to lynx habitat and would selectively reduce access opportunity for trappers and wood cutters.

Refuge and Connectivity

Alternative 2 would increase the size of potential refuge zones by consolidating adjacent areas (closing intervening roads) and enlarging others (closing peripheral roads). Connectivity shows that Alternative 2 would produce 17 large non-motorized habitat blocks (>1,500 acres) averaging 6,583 acres in size (as measured from the edges of surrounding open routes). However, the total acreage of habitat within such blocks would decrease slightly from 113,325 acres to 111,905 acres. Grizzly bear habitat analysis indicates that the Plan Area would continue to support 6 areas larger than 2,500 acres with boundaries at least 0.3 miles from open routes—with average size would increasing from 6,801 acres to 9,207 acres (Table 3.68).

Snow Compaction

Alternative 2 would reduce the the current network of active snowmobile trails in the travel planning area from 425 miles to 409 miles, resulting in a 5-mile reduction of packed trails in lynx habitat. Trails "specified" or "allowed" by the travel plan would increase from 348 miles to 393 miles—a net increase of 32 miles in lynx habitat. But, all of these trails were active prior to 1999-2000 and have been tallied as part of the baseline condition for the *CLACS.* In the end, then, Alternative 2, by reducing the actual

mileage of snowmobile trails, would contribute to the consolidation and improvement of lynx habitat. The alternative thus complies with *NRLMD* Guideline HU G11 with regard to over-the-snow routes.

No snowmobile play areas would be designated in Alternative 2, and no expansion of existing non-designated play areas is likely (F. Bailey, personal communication 2011). The area closed to off-route snowmobiling would expand from 31,250 acres to 40,880 acres, with new closures in Tenmile Creek, Mike Renig Gulch-Hahn Creek, Sweeny Creek, and on the Avon Valley face. Alternative 2 would comply with designated play area direction in *NRLMD* Guideline HU G11.

Alternative 3

Effects of Open Roads

Alternative 3 would implement the greatest reduction in the reach of roads and trails open to wheeled vehicles and snowmobiles. Under this option, open routes would decline by 76 miles from 466 miles to 390 miles. This would, in turn, incrementally reduce trapper access to certain lynx habitat sites and reduce the area from which snags and woody debris could be removed from the road corridor by firewood cutters.

Refuge and Connectivity

Alternative 3 would increase the acreage of potential lynx refuges. Connectivity analysis shows 14 large non-motorized habitat blocks (>1,500 acres), averaging 8,666 acres. Total acreage of habitat within such blocks would increase from 113,325 acres to 121,330 acres. Grizzly bear habitat analysis indicates that the Plan Area would continue to support 7 areas larger than 2,500 acres surrounded by 0.3-mile buffers. The average size of these areas will increase from 6,801 acres to 10,349 acres [Table 27].

Snow Compaction

Alternative 3 would reduce the network of active snowmobile trails in the Plan Area from the current 425 miles to 407 miles. This would produce a decline of seven miles in lynx habitat. Of these active trails, those “specified” or “allowed” by the travel plan would increase from 348 miles to 387 miles: In lynx habitat the increase would be 28 miles. Since these trails were calculated as part of the “baseline condition” in 1999-2000, there would be no increase in active packed trails. In the end, Alternative 3, would reduce the actual mileage of snowmobile trails and would thus contribute to the consolidation and improvement of lynx habitat. The alternative would thus comply with *NRLMD* Guideline HU G11 with regard to over-the-snow routes.

No specific snowmobile play areas would be designated in Alternative 3, and no expansion of existing (though non-designated) play areas is foreseen (F. Bailey, personal communication 2011). The area closed to off-route snowmobiling would be expanded from 31,250 acres to 44,980 acres, with new or expanded area closures in Tenmile Creek, Mike Renig Gulch–Hahn Creek, Sweeny Creek, and on the Avon Valley face. Alternative 3 would comply with snowmobile play area direction in *NRLMD* Guideline HU G11.

Alternative 4

Effects of Open Roads

Under Alternative 4, roads and trails open to wheeled vehicles and snowmobiles would decline from current levels by 63 miles (from 466 miles to 403 miles). This would reduce trapper access to certain lynx habitat sites and reduce the area from which snags and woody debris can be removed from the road corridor by firewood cutters. Alternative 4 would maintain 13 miles more open road and motor trail than Alternative 3 but 54 miles less than Alternative 2.

Refuge and Connectivity

Alternative 4 would increase the acreage of potential lynx refuges from current levels somewhat less than Alternative 3. Connectivity analysis shows 16 large non-motorized habitat blocks (>1,500 acres) averaging

7,575 acres under Alternative 4. Total acreage in these blocks would increase from the current 113,325 acres to 121,195 acres. Grizzly bear habitat analysis indicates that the Plan Area would continue to support 8 areas larger than 2,500 acres surrounded by 0.3-mile buffers. The average size of these areas would increase from the current 6,801 acres to 8,795 acres (Table 3.68)

Snow Compaction

Alternative 4 would reduce the the current network of active snowmobile trails in the travel planning area from 425 miles to 398 miles—a decline of six miles in lynx habitat. Of these trails, 348 miles are currently "designated"or "allowed" by the travel plan: This number would increase to 379 miles in Alternative 4. The result in lynx habitat would be an increase of 28 miles of "designated" routes. As with Alternatives 2 and 3, Alternative 4 would comply with *NRLMD* Guideline HU G11 with regard to over-the-snow routes, since these trails were calculated as part of the "baseline condition" for the *CLCAS* in 1999-2000. The upshot is that the alternative would contribute to the consoliodation and improvement of lynx habitat by reduccing the actual mileage os snowmobile routes on the ground.

No snowmobile play areas would be designated in Alternative 4, and no expansion of existing (though non-designated) play areas is foreseen (F. Bailey, personal communication, 2011). The area closed to off-route snowmobiling would be the same as in Alternative 3: 44,980 acres. The alternative would comply with snowmobile play area direction in *NRLMD* Guideline HU G11.

Cumulative Effects

This summary is based on the detailed matrix in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect lynx and lynx habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, municipal, and BLM). This summary is common to all alternatives.

Lynx have large home ranges and travel great distances. Therefore, activities occurring throughout the Divide landscape, in bordering areas of adjacent landscapes, and on nearby private, municipal, State, and BLM lands may be of some relevance. Adjacent National Forest lands—the Blackfoot landscape on the Lincoln Ranger District to the north and the Beaverhead-Deerlodge NF to the south—are of particular importance. Most of the non-Forest lands bordering the HNF to the east and west on either side of the Continental Divide are at relatively low elevation (below 5,500 ft) and do not provide suitable habitat for lynx occupancy, but they may serve as linkage or occasional travel zones. Non-Forest lands that are capable of providing viable habitat are private and State inholdings within National Forest boundaries at higher elevation (cool forest habitats above 5,500 ft).

Forest Service Past and Ongoing Activities

Some recent and ongoing activities on the National Forest have had a mixed influence on lynx and lynx habitat. Timber harvest over the last 20 years has created clearcuts of all sizes. In each case, this initially created blocks of unsuitable lynx habitat—some of it persisting over the long term. But where seral communities dominated by dense sapling conifers have developed, viable snowshoe hare habitat has emerged. These harvest units have created a mosaic of early and later successional habitats across the landscape—an arrangement generally more favorable to lynx than an unbroken sea of mature/pole forest. Timber harvest projects that have had this effect in lynx habitat, to one degree or another, include: Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Lava Mountain, and Buffalo Creek. Ongoing harvest activity in the Clancy-Unionville planning area is having some impact on potential lynx habitats—primarily by taking out dead trees that could, in some circustances, provide denning habitat components. Be that as it may, the *NRLMD* has determined that denning habitat is not a limiting factor for lynx and has not put forward a standard or guideline to address it (see *NRLMD ROD*, p. 17). These areas will develop as stand-initiation

hare habitat in the next 10-20 years. Recently completed and ongoing hazard tree removal along open roads (Forest-wide Roadside Hazard Tree Removal project) and in developed recreation sites (Park Lake, Cromwell Dixon, Kading Moose Creek campgrounds; CDNST trailhead) should have no effect on lynx.

Likewise, management of grazing allotments has proven detrimental to lynx simply by virtue of its allowing large numbers of cattle to continue impacting HNF resources that may be of use to lynx and, more importantly, to primary lynx prey (snowshoe hares). On the other hand, revision of allotment management plans over the past 2 decades has reduced cattle numbers and spawned a variety of range improvements aimed at protecting riparian sites. These projects have conspicuously improved vegetation condition in many riparian and other wet sites, restoring foraging opportunities for lynx.

Actions that have improved prospects for lynx include: closure of Inventoried Roadless Areas to snowmobiles (Electric Peak, Lazyman); trail relocation projects that have moved trails from riparian areas to upslope sites (Blackfoot Meadows, CDNST); initiation of the Statewide OHV Plan (2001), which prohibits riding off established motor routes; road and motor trail closures associated with timber harvest projects that have expanded blocks of non-motorized habitat (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain, Lava Mountain).

Activities that have locally reduced the effectiveness of potential lynx habitat or, in some cases, had a mixed effect include: retention of private recreational residences on HNF land (particularly in the linkage area near MacDonald Pass); retention of numerous groomed snowmobile trails in lynx habitat; retention of numerous roads passing through key lynx habitat (saddles, forested stringers, riparian areas, denning habitat stands).

Recent and ongoing travel planning efforts on adjacent Ranger Districts could benefit lynx by expanding security areas and reducing snow compacting activity. Lynx range widely, and enhanced habitat conditions in adjacent aras could aid lynx populations and subsequent dispersal to the Divide landscape. Conversely, travel management decisions elsewhere could reduce lynx populations in those areas and lower the potential for emigration/immigration.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development would continue to impact lynx where it occurs in lynx habitat, primarily via degradation of available foraging habitat. It is unlikely that lynx occur on most adjacent non-Forest lands because of their low elevation and a predominance of dry forest and non-forest habitat types. Inholdings at higher elevation often qualify as potential lynx habitat. Many of these holdings have been logged in the last 30 years and are in various stages of succession—most of them not favorable to lynx because of erratic regeneration. Others are in the process of being cleared of most standing timber that has been killed in the ongoing bark beetle outbreak. Where lodgepole pine is the dominant overstory, there is some potential for future development of stand-initiation hare habitat.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect lynx to one degree or another include improvement of the Rimini Road (in a potential travel zone), continued revision of grazing allotment plans, winter travel planning in the Blackfoot landscape, and salvage projects designed to deal with the ongoing bark beetle epidemic (most prominently, the Red Mountain Flume-Chessman Reservoir and Telegraph Creek projects). The Telegraph project also proposes thinning in early-successional lodgepole pine stands—although those qualifying as viable snowshoe hare habitat would be left unthinned. Continued hazard tree removal along open roads and in developed recreation sistes is unlikely to affect lynx.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land in the cumulative effects area that may affect lynx includes: Settlement and associated development of private lands (including new roads); timber harvest and removal of beetle-killed trees; continued snowmobile use and other motorized activity.

Conclusions

Information in this section is summarized in *Appendix C* tables.

Alternative 1 would retain 21 large unroaded habitat blocks, averaging, averaging 5,396 acres, as lynx refuges. Such habitat would total 29,215 acres. Active snowmobile trails would remain at 425 miles and off-trail snowmobile closures at 39,210 acres. While the existing snowmobile trail system may be having some effect on lynx habitat use patterns, lynx do not appear to be adversely affected since they continue to coexist with the system in its current configuration. This trail system would be retained under Alternative 1.

Alternative 2 would consolidate some large unroaded habitat blocks as lynx refuges. The result would be 17 blocks averaging 6,583 acres. Total refuge habitat would be 30,990 acres—1,775 acres more than Alternative 1. Active snowmobile trails in lynx habitat would decrease by five miles. Off-trail snowmobile closures would increase to 46,810 acres. Alternative 2 may affect, but is not likely to adversely affect lynx.

Alternative 3 would consolidate more unroaded habitat blocks as lynx refuges, resulting in 14 blocks averaging 8,666 acres. Total refuge habitat would be 32,990 acres—2,000 acres more than alternative 2. Active snowmobile trails in lynx habitat would decrease by seven miles. Off-trail snowmobile closures would increase to 59,030 acres. As with Alternatives 1 and 2, Alternative 3 may affect, but is not likely to adversely affect lynx.

Alternative 4 would maintain 16 unroaded habitat blocks, with each block averaging 7,467 acres. Total refuge habitat would be 31,125 acres—slightly less than Alternative 3. Active snowmobile trails in lynx habitat would decrease by sixmiles. Off-trail snowmobile closures would increase to 49,710 acres. As with the previous alternatives, Alternative 4 may affect, but is not likely to adversely affect lynx.

All alternatives would comply with relevant standards and guidelines of the *Northern Rockies Lynx Management Direction (NRLMD ROD,* Attachment 1)—which was incorporated into the *Helena Forest Plan* in 2007.

Sensitive Species

Northern Rocky Mountain Gray Wolf

Common Effects of Travel Management

Effects are described in terms of parameters that threaten wolves through (1) human contact and conflict (primarily, livestock grazing, human settlement in the wildland-urban interface, legal wolf hunting and trapping, and illegal shooting); (2) activities that compromise denning or rendezvous sites, and (3) activities that affect the prey base. These follow the three key components of wolf habitat identified in the *Wolf Recovery Plan* (USDI 1987): Viable denning and rendezvous sites, freedom from human interference, and adequate prey.

Human Conflict

In the 19th century, wolf populations declined due to conflicts with humans: pressure from human settlement, livestock predation, a lack of understanding of wolf ecology and habits, and subsequent eradication programs (USDI 1987). By 1920, wolves had been eliminated from most of the 48 contiguous

states (northern Michigan and Minnesota being the only exceptions). Recovery in the northern Rockies began in the 1980s via slow immigration from Canada.

Today, in spite of wolf numbers far below those of the 1800s, wolf-human conflicts have re-emerged, most notably with regard to predation of big game and livestock. Each year from 1997 through 2007, USDA Wildlife Services received an average of 79 complaints of suspected livestock losses to wolves in Montana. Roughly 40% of the losses were confirmed to be wolf kills (Sime *et al.* 2007, p. 18). In 2009, this proportion had risen to 50% (Sime *et al.* 2010, p. 34). Between 2006 and 2010, the number of livestock killed by wolves rose substantially. Wildlife Services reported 79 wolf kills of adult sheep, lambs, and young cattle in 2006. In 2010, the number was 164 kills (Sime *et al.* 2011, p. 33). At the same time, livestock predation by other large predators (grizzly bears, mountain lions, and, particularly, coyotes) has increased dramatically as well: 976 kills in 2006; 4,462 kills in 2010 (see summary in the *Helena Independent Record,* Dec. 12, 2010). In 2011, confirmed losses to wolves dropped off dramatically from 2010 numbers—down to 86 kills statewide. MFWP speculates that this may be due in large measure to targeted wolf control in certain areas with chronic predation problems (Hanauska-Brown *et al.* 2011, p. 14).

Elevated wolf predation is partly, if not primarily, a function of expanding wolf populations. Reasons for the spike in coyote, grizzly bear, and mountain lion predation, however, is less clear, since populations of these carnivores have been stable or have risen at more modest rates than those of wolves. Nonetheless, the return of the wolf to the northern Rockies after an absence of nearly three quarters of a century, coupled with heightened livestock losses and the historic antipathy of ranchers toward this particular carnivore, have served to give the wolf a higher profile than other predators. This is particularly true in local areas where ranchers consistently see losses to their herds (Sime *et al.* 2007, p. 17). Currently, when wolves attack livestock and where further losses appear likely, Wildlife Services, at the direction of MFWP, seeks out and relocates or, most often, kills the offending animals. A total of 583 wolves were killed to resolve conflicts with livestock from 1987 to 2009 in Montana (Sime *et al.* 2010, p. 34).

The impact that wolves can have on native ungulate poplations puts them at loggerheads with many hunters who see them as a threat to their ability to bag an elk or other game animal. In essence, the wolf represents new competition to human predation-by-hunting. So far in Montana, wolves have noticably reduced elk populations to the detriment of hunters in a few local areas, such as in the central Gallatin River watershed, the area immediately north of Yellowstone Park, and along the West Fork of the Bitterroot River (Cunningham 2010; Sime 2010). But many hunters perceive this to be a universal statewide phenomenon—which serves to instill animosity toward wolves among this segment of the population. Anytime these hunters find fewer elk in a given area in any given year—whether it be a function of weather, retreat to private land sanctuaries, a variety of predators, or whatever—they feel it must be due to wolves. It is likely that in parts of the state traditional elk population levels mediated by the old equilibrium between elk, vegetation, and human predation will now move to a lower plateau with this re-emergence of another major predator (aside from humans) into the system [Hebblewhite 2010]. And it will be many years before these new levels are perceived as the norm, and resentment of wolves—and consequent pressure to reduce wolf numbers—declines.

Increasingly, as people settle in the wildland-urban interface and on previously wide-open ranchland, the potential for human-wolf encounters increases. While wolves are not known to have directly threatened humans in Montana, they have killed dogs and other domestic animals. As well, many people perceive wolves as a menacing presence, and it is not uncommon for them to shoot at wolves as a matter of course. Wolves are also sometimes caught in traps set for other animals. A number of wolves have been hit and killed by vehicles on highways in Montana, Idaho, and Wyoming in recent years—including an adult female killed near MacDonald Pass in the Divide travel planning area in 2002.

Denning and Rendezvous Sites

Wolves may use the same *den sites* from one year to the next or maintain several dens in a local area through which they cycle over the years (USDI 1987). Packs are sensitive to human activity near den sites and they may move if disturbed (Ballard *et al*. 1987). Most dens are located well away from trails and backcountry campsites. *Rendezvous sites* are specific resting and gathering areas that wolves use in summer and early fall. Wolves move to several rendezvous sites in the course of a summer, the first one usually located 1 – 6 miles from the natal den. Packs use rendezvous sites until pups are mature enough to travel with the adults. Wolves are most sensitive to disturbance at the first rendezvous site and become less so at later sites (USDI 1987).

The *Wolf Recovery Plan* (USDI 1987) recognized den and rendezvous sites as key components of wolf habitat to be protected from human interference. Based on U.S. Fish and Wildlife Service (USFWS) recommendations, the HNF routinely proposes that known wolf dens on the Forest be buffered from any local project (or recreational activity) by at least at least ½ mile during the denning season. Rendezvous sites are more ephemeral and mobile, but any such sites that can be identified are also buffered from human presence as much as possible while they are active.

Prey Base

Wolves prey primarily on ungulates (USDI 1987). During May and June, wolves focus on newborn deer, moose, elk, and bison in calving/fawning areas. In summer and fall, ungulates constitute the highest percentage of biomass; in winter wolves prey almost exclusively on deer, elk, and moose (although livestock may figure into the mix in ranchland areas). Because ungulates represent the bulk of the wolf's food supply, factors that affect ungulate distribution and abundance (habitat and access management, winter range productivity) also affect wolves. These factors are discussed in previous sections on *Elk* and other big game species.

Roads

Roads have not been identified as a component directly affecting the recovery and viability of wolf populations in the northern Rockies. The presence of roads on the landscape, however, is associated with indirect effects that can put pressure on wolves. These include the effect that roads have on the local abundance and distribution of ungulate populations upon which wolves depend for food; greater potential for human interference at key sites, such as dens; and the loss of space free from regular human presence in general. Other indirect effects are the potential for mortality associated with vehicle accidents and illegal shooting that roads facilitate (Theil 1985; Mech 1989; Mech *et al.* 1988; Boyd and Pletscher 1999).

Alternative 1, No Action

There have been no known dens or rendezvous sites in the travel planning area in the last several years (the last known sites being those associated with the Great Divide pack prior to 2003). Consistent wolf activity in the upper Tenmile drainage over the past five years, however, suggests that there may have been den and rendezvous sites on the Forest in that area. Denning sites of known packs are located and monitored by MFWP each year and the information passed on to the HNF so that adjustments to activities on the Forest, including travel management, can be made to protect denning sites while they are active. As a result, retention of the staus quo in Alternative 1, would have no effect on these key sites

Alternative 1 would comply with all *Forest Plan* big game standards, and elk and deer populations in the Divide landscape are currently robust [see *Affected Environment* for *Elk, Mule Deer,* and *Moose* above]. Retention of the existing condition would not imperil the ungulate prey base for current and future wolf packs.

The availability of large blocks of habitat free from motorized disturbance under Alternative 1 has been quantified and discussed in previous sections on *Grizzly Bear* and *Connectivity and Fragmentation* [see Tables 15, 16, 23, 24]. The fact that the Divide landscape and adjacent areas have been occupied by resident wolf packs more or less continuously since 1995 suggests that these areas provide sufficient space for wolves to escape human presence. Wolf packs have run into trouble confronting human enterprises (notably livestock operations) almost entirely on private lands away from the National Forest. But while on the National Forest, wolves have seldom, if ever, been involved in negative encounters with humans or livestock. The reasons for their disinclination to pursue cattle on National Forest summer ranges is unknown.

Alternative 2

Alternative 2 is highly unlikely to affect established denning or rendezvous sites. It would reduce slightly the total acreage in non-motorized habitat patches larger than 15,000 acres (see Table 3.57). On the other hand, it would increase the acreage of non-motorized blocks larger than 2,500 acres (and more than 0.3 mile from open roads) (see Tables 3.67 and 3.68). In either case, the changes in availability of habitat in which wolves might establish dens and carry on with other activities on the Forest away from regular human presence would be relatively small under Alternative 2 and would have no measurable effect on wolf population viability.

In terms of the availability of large prey, while Alternative 2 would increase the acreage of elk security areas (from 33% to 34% of the fall range) [Table 3.64], elk numbers would be unlikely to measurably increase as a result of this change alone. The primary factor determining the size of local elk populations in the future would not be due to variations in travel plan alternatives, but rather, to the number and variety of elk hunting permits allowed by Montana Fish, Wildlife, and Parks. The roads certainly facilitate hunting opportunity, but overall population numbers are a direct result of hunter success. In this regard, the degree to which hunters are able to access off-Forest lands where elk often seek refuge during the hunting season would also affect elk numbers. Block management agreements and State land purchases (as in the Spotted Dog country) would drive this access. Alternative 2 would allow elk to continue inhabiting the plan area at least at current population levels, thereby assuring a prey base for wolves.

Alternatives 3 and 4

Effects would be similar for Alternatives 3 and 4. As with Alternatives 1 and 2, Alternatives 3 and 4 would have no effect on established denning or rendezvous sites. Both alternatives would increase the total acreage of large non-motorized habitat patches—expanding the areas in which wolves can establish new dens and carry on with other activities away from regular human interference. But, the effects, in terms of their contribution to wolf population viability, are unlikely to be measurable.

Although Alternatives 3 and 4 would both improve elk summer habitat effectiveness (Table 3.61) and expand the acreage of elk security areas (Table 3.64), elk numbers are unlikely to measurably increase as a result of these changes alone. Population increases could result, however, from a combination of improved elk habitat effectiveness and security on the National Forest and lower harvest rates resulting from more restrictive hunting regulations via MFWP. Given that any notable increase in current elk populations in the Divide landscape—one large enough to effectively benefit wolves—is likely to run afoul of landowner concerns with excess elk competing with livestock on wintering grounds, this is an unlikely scenario. Most likely, under Alternatives 2 and 3, elk would continue inhabiting the plan area at something close to present population levels, maintaining a reasonable prey base for resident and transient wolves.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management,

that may affect wolves and wolf habitat components. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and enough surrounding non-Forest lands to encompass known den sites since 1995—in particular, sites along Spotted Dog Creek, roughly 3 miles beyond the western HNF boundary, and in China Gulch, about ¾ mile beyond the NE corner of the planning area. Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Recent and ongoing activities on the National Forest that have improved prospects for wolves include: Establishment of the Statewide OHV Plan, which prohibits riding off established motor routes, thus reducing potential for negative wolf-human encounters; grazing allotment revisions that have generally reduced cattle numbers and grazing seasons, thus improving habitat conditions for big game species while at the same time reducing potential for wolf-livestock interaction on the Forest; road and motor trail closures associated with timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain, Lava Mountain) that have expanded blocks of non-motorized habitat and potentially reduced opportunity for negative wolf-human encounters; trail relocation projects that have removed trails from riparian areas to upslope locations away from sites more likely to attract wolves and their prey (Blackfoot Meadows, CDNST).

Activities that have increased the likelihood of wolf-human encounters include: road permits for access across HNF land to private holdings; retention of private recreational residences on HNF land (esp. at MacDonald Pass near the center of the linkage zone); small mining operations (under the 1872 Mining Act) in areas where wolves have been observed; construction and maintenance of communications sites and power lines; efforts to spread livestock distribution across allotments, which may bring cattle into areas where they are more vulnerable to wolf predation; retention of grazing allotments on the Forest providing ongoing opportunity for wolf predation; retention of numerous dispersed camping sites; unrestricted back-country recreation (backpackers, day-hikers, horseback riders, hunters).

The recent establishment (2009) and ongoing evolution of the State wolf hunting program is not limited to National Forest land. But, because much of the big game hunting in the Divide landscape occurs on the HNF and because many of the wolves that have been harvested over the past four years have been shot by hunters looking primarily for deer and elk, wolf hunting is likely to have an important impact on animals that normally range over the Forest.

Adjacent Private and Other, Past and Ongoing Actions

Private land development (primarily rural home building) is continuing to create more sites that prove troublesome for wolves moving through the landscape (bringing them into contact with human habitation, domestic animals, and residents with guns). Ranching operations on private lands near the Forest have proven to have high potential for wolf-human conflict. Wolves inevitably descend to private ranch and agricultural lands in the valleys as winter comes on, and, sometimes, they remain there yearlong. This has been a problem primarily in the Avon Valley and Greater Spotted Dog Creek drainage along the west side of the Divide landscape—a circumstance that may, in part, be related to elk coming down off the Forest in early-mid fall to avoid hunters on the National Forest and remaining in the valleylands for up to 8 months. In the last few years, wolves have also been attacking livestock on Sieben Ranch Company lands northeast of the landscape, although this area is some 10-15 miles distant across the Little Prickly Pear Valley. The demise of most wolf packs that have inhabited the Divide landscape has resulted from their preying on domestic livestock and their subsequent removal by Federal and State agencies.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect wolves to one degree or another include improvement of the Rimini Road, which will allow higher traffic speeds in a potential wolf travel zone;

continued implementation of grazing allotment revision, which will shift cattle cattle distribution local. Large timber harvest projects designed to deal with the ongoing bark beetle epidemic (Telegraph Creek, Red Mountain Flume-Chessman Reservoir projects) and continued hazard tree removal projects at a number of developed recreation sites and along roadsides may cause wolves to avoid local areas while project operations are active but will not alter habitat in ways that would benefit or cause problems for wolves.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land in the cumulative effects area that may affect wolves is mostly a function of continued settlement and development of private lands (including new roads)—activities that increase potential for wolf-human encounters. Unlike many large carnivores on the HNF, wolves frequently inhabit and travel through the maze of private and public lands in the valleys and foothills adjacent to the Forest. Continued development of these lands may put pressure on wolves to seek out more isolated habitats on the National Forest.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Alternative 1 would maintain the status quo—which is not negatively impacting wolves.

Alternative 2 would reduce open road density in some areas, increase it in others; it would reduce the acreage of non-motorized habitat blocks larger than 1,500 acres but increase the acreage of non-motorized blocks larger than 2,500 acres. In sum, it would provide a mixed bag of changes—none of them substantial enough to influence wolf population viability.

Alternative 3 would reduce the potential for wolf-human encounters by lowering open road density and substantially increasing the acreage of large non-motorized habitat blocks (however measured). It would reduce the potential for negative wolf-human encounters more than Alternative 2, but not enough to measurably influence population viability.

Alternative 4 would maintain slightly higher open road density and slightly less acreage in large non-motorized habitat patches than Alternative 3. But the two alternatives are very similar, and effects would be likewise.

Virtually all problems with wolves in and around the Divide landscape since their arrival in the late 1980s have been on private or other non-forest lands: They have not been driven by management actions or other circumstances on the HNF. This scenario is expected to continue.

All alternatives would comply with guidance established by the *Wolf Recovery Plan* as to actions that influence human-wolf conflict, denning and rendezvous sites, and the big game prey base.

Wolverine

Effects on wolverines are described in terms of (1) human activity in areas likely to support natal denning sites and (2) the availability of safe havens where motorized use and human activity in general is absent or occurs at low levels. The abundance of ungulate carrion—an important consideration for wolverines—is a function of big game habitat management by the HNF and hunting regulation by MFWP, and is not addressed in this section.

Common Effects of Travel Management

Remote country appears essential to wolverine viability (Hornocker and Hash 1981). Human encroachment into existing back-country refuges may threaten the wolverine's ability to maintain basic life history requirements (Copeland and Hudak 1995). Certain activity may lead to habitat fragmentation that could limit basic interaction between wolverine subpopulations (Copeland 1996). It has been

hypothesized that the persistence of wolverines in Montana, despite unlimited historic trapping and hunting, may be a function of extensive designated wilderness and remote, inaccessible habitat (Hornocker and Hash, 1981; Ruggerio *et al*. 1994).

High road densities and the associated human activity are known to disturb wolverines. Roads may eliminate the potential for otherwise suitable foraging and denning habitat, reducing chances of successful kit rearing (Copeland 1996). Roads allow access to hunters and trappers and increase the possibility of poaching (Hornocker and Hash 1981). Wolverines are renowned for their vulnerability to trapping and susceptibility to over-harvest (Claar *et al.* 1999).

Technological advances in snowmobiles and increases in winter recreation in general (cross-country skiing, helicopter skiing, snowshoeing) have elevated the probabilities of displacing wolverines from potential denning habitat (Copeland 1996). Magoun and Copeland (1998) found that females in Idaho moved their young to new maternal den sites after disturbance by researchers. Risk of litter loss is potentially high if den relocation occurs. Because wolverines have low reproductive rates, such losses are magnified to a greater extent than in most mammal populations. Squires and others (2002) did trap wolverines in areas of high snowmobile activity, indicating that the animals do not necessarily avoid these areas—although reproductive success may be impaired. In general, refuge zones—both for denning and for general daily activity—may be the most important habitat components for wolverines. Protection of viable high-elevation denning sites where deep snow persists in spring is likely to take on added importance in the future as global warming continues to shrink the size of these areas, potentially eliminating some of them entirely.

Ungulate carrion is a primary winter food item for wolverines; so, human activities that reduce elk and deer populations can also affect wolverines (Banci 1994; Copeland 1996). Be that as it may, it is highly unlikely in the northern Rockies that ungulate populations could decline to such a level that local wolverines would be measurably affected.

Natal and Maternal Denning Habitat

The Region 1 wolverine habitat model has not identified any natal/maternal denning habitat in the Divide landscape. A few sites in the landscape, however, do exhibit characteristics typical of wolverine denning sites (for both natal and maternal dens). These are mountain basins with rockslides and avalanche chutes on steep slopes that tend to accumulate woody or rocky debris, as well as deep snow that persists through the spring. Areas with these components include the eastern slopes of Nevada and Black Mountains in the north end of the landscape and slopes and basins on Lee Mountain, Red Mountain, Cliff Mountain, Electric Peak, Jericho Mountain, Bison Mountain, Thunderbolt Mountain, and Luttrell Peak in the southern half of the landscape.

A perusal of these areas on Divide travel plan alternative maps indicates that none of them supports snowmobile trails or known snowmobile play areas close enough to potential denning sites to be of concern. Habitat sites on Electric Peak and on Nevada, Black, Thunderbolt, Cliff, and Bison Mountains are in or adjacent to Roadless Areas where snowmobile use is prohibited or impractical because of difficult terrain. Potential habitat on Red Mountain is also too difficult for snowmobilers to access. Sites on Lee Mtn. and Luttrell Peak are close to active and historic mining operations, but not in areas likely to pick up snowmobile use. None of the action alternatives would generate new snowmobile use in any of these areas, and it is highly unlikely that any of them would impact wolverines at natal or maternal denning sites.

Non-Denning Refuges

Beyond the denning season, wolverines are drawn to relatively large blocks of habitat, abundantly forested, in which human presence is minimal. Such areas have been assessed previously in sections on *Connectivity and Fragmentation* (non-motorized habitat patches larger than 1,500 acres) [Tables 3.57 and

3.58], *Grizzly Bear* (non-motorized habitat blocks larger than 2,500 acres and at least 0.3 mile from open roads) [Tables 3.67 and 3.68], and *Elk* (elk security areas larger than 250 acres and at least 0.5 mile from open roads) [Tables 3.63 and 3.64]. These habitat blocks are important to male wolverines year-round and to adult female wolverines outside the natal denning season as areas in which they can forage, rest, breed, raise young, and travel with minimal human interference.

Table 31, below, summarizes total acres in refuge zones available to wolverines as calculated by these three different analyses. It is uncertain which of these assessments best reflects the needs of wolverines in terms of separation from human activity. Connectivity analysis, which calculates non-motorized acreage from the edge of surrounding open roads, provides a much broader estimate of available refuge habitat (ranging from 63% to 68% of the Plan Area) than the two analyses that buffer the distance from roads (by 0.3 mile for grizzly bear habitat and by 0.5 mile or more for elk security). Refuges measured by the grizzly bear analysis cover about 31% - 41% of the plan area and those measured via elk security area analysis cover about 50%-58% [9].

As is evident in Table 3.72, Alternatives 3 and 4 would provide notably more non-motorized habitat than Alternatives 1 and 2, regardless of the analysis method.

Table 3.72 Three measures of the acreage of non-motorized sanctuaries available to wolverines in the Divide Travel Plan Area under different alternatives

Measures of Non-Motorized Habitat	**Acres of Potential Refuges in the Planning Area**			
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**
Connectivity Analysis: Non-Motorized Habitat Blocks >1,500 acres with No Road Buffer	113,325	111,905	121,330	121,195
Grizzly Bear Analysis: Non-Motorized Habitat Blocks >2,500 acres more than 0.3 mi from Open Roads	54,270	55,242	72,441	70,362
Elk Security Analysis: Non-Motorized Habitat Blocks >250 acres more than 0.5 mi from Open Roads	76,370	78,897	88,052	87,378

However measured, the amount of habitat with low human presence has been sufficient in the past to sustain a small, apparently resident, wolverine population in the Divide landscape. Biologists, local residents, and other Forest users have been reporting the presence of wolverines for more than 20 years, and recent winter tracking surveys have verified the presence of at least 2 adult males in the area and suggested the presence of more animals. By this measure, refuge habitat appears adequate. Alternative 2 (in 2 of 3 analyses) would improve this situtation and Alternatives 3 and 4 (in all 3 analyses) would improve it more.

Alternative 1, No Action

No known wolverine natal or maternal denning habitat is threatened by current patterns of snowmobile use or other winter recreation in the Divide landscape. This status is preserved in Alternative 1. Non-

[9] These percentages are higher than those from elk security analyses (Table 23) since they are calculated only for the Travel Plan Area rather than for the entire Divide landscape as in the elk security analysis.

motorized refuges would continue to occupy approximately 64% of the travel planning area as calculated by connectivity analysis, 31% of the area as calculated by grizzly bear refuge analysis, and about 50% of the area as calculated by elk security area analysis.

Alternative 2

Alternative 2 would not add snowmobile routes in areas with potential to support wolverine natal or maternal denning habitat. It would increase the area closed to off-trail snowmobile riding. No wolverine denning habitat would be threatened by resulting patterns of snowmobile use or other winter recreation in the Divide landscape.

Under Alternative 2, non-motorized sanctuaries would occupy approximately 63% of the travel planning area as calculated by connectivity analysis, 31% of the area as calculated by grizzly bear refuge analysis, and 52% of the area as calculated by elk security area analysis.

Alternative 3

Alternative 3 would not add snowmobile routes in areas with potential to support wolverine natal/maternal denning habitat. It would increase the area closed to off-trail snowmobile use. No wolverine denning habitat would be threatened by the pattern of snowmobile use or other winter recreation in the Divide landscape. Under Alternative 3, non-motorized refuges would occupy 58% of the area calculated by elk security area analysis, 41% of the area calculated by grizzly bear refuge analysis, and 68% of the plan area calculated by connectivity analysis.

Alternative 4

In terms of snowmobile access, Alternative 4 is identical to Alternative 3, and it would have essentially no effect on wolverine natal/maternal denning habitat. By increasing the area closed to off-trail snowmobile riding, it would lower the potential for negative human-wolverine encounters in winter. Under Alternative 4, non-motorized refuge areas would occupy about 68% of the travel planning area as calculated by connectivity analysis, 40% of the area as calculated by grizzly bear refuge analysis, and 58% of the area as calculated by elk security area analysis.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect wolverines and wolverine habitat components. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Wolverines that currently occupy the Divide landscape are known to use areas immediately adjacent to the National Forest—and, in fact, Wild Things Unlimited tracked one animal through part of the town of Elliston during the winter of 2009-2010 (Gehman *et al.* 2010, p. 7, 11). However, there is no indication that wolverines range further out into the valleys well beyond HNF boundaries. Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Recent and ongoing activities on the National Forest that have improved prospects for wolverine include: area closures for snowmobiles in the Electric Peak and Lazyman-Black Mountain Roadless Areas; establishment of the Statewide OHV Plan, which prohibits riding off established motor routes; road and motor trail closures associated with timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Lava Mountain, Treasure Mountain). These decisions have expanded blocks of non-motorized habitat and potential wolverine refuges.

Activities that have locally reduced the effectiveness of potential wolverine habitat to one degree or another include: numerous road permits allowing access across HNF land to private holdings; retention of private recreational residences on HNF land (esp. in the linkage zone at MacDonald Pass); small mining

operations (under the 1872 Mining Act) in areas where wolverines have been observed; construction and maintenance of communications sites and power lines; development and retention of numerous snowmobile trails in potential wolverine habitat; retention of numerous dispersed camping sites and unrestricted back-country recreational use (backpackers, day-hikers, horseback riders, hunters).

These activities increase, to one degree or another, the potential for wolverine-human encounters and reduce the country through which wolverines are able to roam generally free from human influence. Few, if any, of these enterprises are likely to disrupt wolverine natal denning sites—the exception being large-scale, year-round mining operations at high elevation (the Luttrell Pit at the southern edge of the analysis area being the only current example). Other activities that may approach potential denning habitat do not occur during the wolverine denning period (winter and early spring). High-elevation snowmobile routes and play areas, which have caused problems for denning wolverines in other parts of the northern Rockies, are not located near perspective denning sites in the Divide landscape.

New road systems associated with timber sales, some of which remain open to vehicle use, have reduced unroaded wolverine habitat and increased access for trappers. These include Bison Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Lump Gulch, Ophir Creek-Cave Gulch, Deadman, among others. Timber harvest itself has a mixed effect on wolverine habitat and the ability of wolverines to avoid humans and find food. In general, projects that have removed good quality cover and complex understory habitat supporting diverse potential food sources have been detrimental. Those that have improved habitat productivity by opening up dense, stunted forest and increasing edge and ecotone may be beneficial.

Ongoing and recently completed removal of beetle-killed trees from along Forest roads (Forest-wide Hazardous Tree Removal Poject, 2010) and in administrative and developed recreational sites (Kading, Moose Creek, Cromwell Dixon, Park Lake, campgrounds; MacDonald Pass CDNST trailhead; Tenmile picnic area; Moose Creek cabin) are unlikely to have any meaningful effect on wolverines.

Adjacent Private and Other, Past and Ongoing Actions

Private land development (primarily rural home building) is continuing to create more sites that prove problematic for animals attempting to move through or occupy the landscape (barriers to movement, habitat loss, food attractants, dogs). Many of these developments are at low elevation in areas seldom traversed by wolverines, but some are associated with higher elevation inholdings (Telegraph Creek, Ontario Creek, Little Blackfoot, upper Tenmile) and may create problems. The towns of Rimini and and a number of dwellings on mid-high elevation Forest inholdings occupy ground that might otherwise be favorable as wolverine habitat. Cabins used only seasonally or intermittantly throughout the year, especially those that harbor stored food, may attract wolverines. The Great Divide ski area on BLM land in the northeast part of the analysis area usurps a large block of potential habitat that wolverines are now likely to avoid in winter.

Forest Service Reasonably Foreseeable Actions

Hazard tree removal and dead tree salvage projects resulting from the bark-beetle epidemic have some short-term potential for negative human-wolverine encounters while work is in progress but are unlikely to generate meaningful habitat problems or benefits. The most prominent of these projects are the Red Mountain Flume-Chessman Reservoir and Telegraph Creek fuels projects. While these projects propose to harvest dead trees that could conceivably provide woody debris piles in which wolverines might den, the potential for future denning in the proposed harvest units once trees fall is low (elevations are too low, there are no no avalanche chutes or large rockslides nearby, density of large dead trees is generally too low, most areas are too close to regular human activity). Wolverines could use accumulated deadfall, if not for denning, then for resting or escape cover. Removal of dead trees, then, would influence future movement patterns. Given the abundance and wide distribution of non-harvested areas, however, the low density of the local wolverine population, and the adaptability of wolverines to a wide array of habitat

formations, it is highly unlikely that the proposed projects would have any influence on the ability of wolverines to continue to occupy the landscape. Proposed hazard tree removal along open roads and in developed recreation sistes would have no effect on wolverines.

Adjacent Private and Other, Reasonably Foreseeable Actions

The primary foreseeable activity on non-Forest land within the cumulative effects area that can affect wolverines is the ongoing development of private inholdings (building construction, road building, forest clearing, local mining, and general human activity).

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Alternative 1 would maintain large non-motorized sanctuaries at the current level of about 64% of the travel planning area (as calculated by connectivity analysis). Alternative 2 would shrink large non-motorized refuges slightly to about 63% of the Plan Area. Alternative 3 would increase the reach of large non-motorized refuges to about 68% of the travel planning area. Alternative 4, like Alternative 3, would increase large non-motorized havens to about 68% of the travel planning area. The small, but persistent local population of resident wolverines would remain in place under all alternatives.

None of the effects generated by this project or by other Helena NF fuels/timber management projects in the Divide landscape are factors contributing to the wolverine being proposed for listing under the Endangered Species Act. The USFWS has indicated that proposed listing has arisen from concerns over the loss of natal denning habitat due to global warming.

None of the alternatives would negatively impact key habitat components for wolverines: No natal denning habitat would be disrupted by roads or snomobile use and the acreage of non-motorized habitat refuges (as measured from roads' edge) would decrease slightly, remain steady, or increase (see Table 3.72, row 1).

Fisher

Common Effects of Travel Management

Fishers do not necessarily avoid roads and areas of human settlement, but the loss of suitable forest habitat that often accompanies these developments has been a primary reason for population decline (Heinemeyer and Jones 1994). Habitat loss and lessened habitat effectiveness in riparian areas is especially detrimental. Even in areas unaffected by timber harvest or clearing for building, firewood cutters typically remove most large snags from open road corridors, eliminating a key habitat component of potential use to fishers. Another problem has been trapping—often abetted by roads and other access channels for trappers on snowmobiles. Fishers are wide-ranging, curious, and opportunistic, and thus highly susceptible to trapping. Even in areas where quotas are minimal or where fishers are off-limits to trapping, they are caught incidentally in sets for other species (Jones 1991).

Alternative 1, No Action

Alternative 1 would retain the current configuration of motor routes. This includes 332 miles of roads open to wheeled vehicles on public land (and thus, open to firewood cutters) and 425 miles of routes used by snowmobiles. Trapping access to potential fisher habitat (primarily, patches of riparian forest) would remain at its current level. Trapping activity in the Divide landscape is variable from year to year, but generally low. This, combined with the rarity of fishers in the landscape, has resulted in no fishers being caught in recent decades. The potential for fisher mortality via trapping, as facilitated by the road/trail network, would remain slight.

Alternative 2

With Alternative 2, open road miles on public land would remain much the same as in Alternative 1, declining by only 3 miles to 330 miles. The area from which firewood cutters would be able to remove large snags and logs that might be useful to fishers would thus be essentially unchanged. Roads and trails available to snowmobiles would decline from 418 to 399 miles. At the same time, an additional 9,630 acres of off-route areas would be closed to snowmobiles. Assuming that most trappers make use of established snowmobile routes for setting traplines rather than pushing out into off-route areas, the key change under Alternative 2 would be the decline in available routes. This would decrease trapper access to a variety of habitats, including a limited amount of potential fisher habitat.

Alternative 3

Alternative 3 would produce the largest reduction in open road mileage on public land: from 333 miles to 292 miles—a decrease of 41 miles in road corridor accessible to firewood cutters. An additional 13,730 acres would be closed to off-route snowmobile use and roads/ trails available to snowmobiles would decline modestly from the current 418 miles to 409 miles. Trapper access to potential fisher habitat would thus decrease slightly.

Alternative 4

In Alternative 4, roads open to firewood cutters would fall partway between Alternatives 2 and 3 at 306 miles (a decrease of 27 miles from current conditions). As with Alternative 3, areas available for off-route snowmobiling would decline by 13,730 acres. Roads and trails available to trappers on snowmobiles would decrease by 11 miles to 406 miles—more than Alternative 2 (399 miles), slightly less than Alternative 3 (409 miles). Given the rarity of fishers in the landscape and the relatively small amount of primary fisher habitat penetrated by the road system, these changes (under Alternatives 2 , 3, and 4) would be unlikely to measurably affect prospects for fisher viability on the HNF or in this part of the northern Rockies in general.

Cumulative Effects

The cumulative effects summary is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and activities that may affect fishers and fisher habitat components. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Past timber harvest in the Divide landscape, has removed mature and old-growth forest capable of providing primary fisher habitat (in particular, mid/low-elevation riparian forest). Timber harvest projects that have had this effect, to one degree or another, include: Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Sound Wood, and Treasure Mountain, among others. Among smaller projects are the MacDonald Pass ski trail hazard tree project (in productive forest habitat just below the Divide) and a number of tree removal operations scheduled for campgrounds, picnic areas, and other developed recreational sites (which are unlikely to provide viable fisher habitat).

Primary actions that have locally reduced the effectiveness of potential fisher habitat by providing access for trappers and firewood cutters include retention of groomed snowmobile trails roads passing through forested riparian habitat.

Actions that have improved prospects for fishers include: closure of Roadless Areas to snowmobile use (Electric Peak, Lazyman); trail relocation projects that have removed trails from productive riparian areas to upslope locations (Blackfoot Meadows, CDNST); establishment of the Statewide OHV Plan, which

prohibits riding off established motor routes; road and motor trail closures associated with timber harvest (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain) that have expanded blocks of non-motorized habitat.

Recent and ongoing travel planning efforts on adjacent Forests, as well as the Lincoln Ranger District, could be beneficial to fishers if they provide local safe havens free from motorized access. Because fishers are capable of traveling some distance, improved habitat conditions on other Forests could improve fisher populations and subsequent dispersal opportunities to the Helena National Forest. Conversely, travel management decisions elsewhere could reduce fisher populations in those areas and reduce the potential for emigration/immigration.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development (building construction, clearing, thinning, commercial timber harvest, dead tree salvage) will continue to impact potential fisher habitat, particularly where it occurs in forested riparian areas. Actions that reduce key habitat components (large snags and logs, overhead cover) could have an effect.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that could affect fishers to one degree or another include salvage projects designed to deal with the ongoing bark beetle epidemic which will remove substantial numbers of large dead trees, some of which could be of use to fishers. These include the Telegraph Creek and Red Mountain Flume-chessman Reservoir projects (although neither area contains more than small fragmented patches of potentially suitable fisher habitat).

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that could affect fishers includes; settlement and associated development of private lands, timber harvest, and removal of large beetle-killed trees.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Fishers are extremely rare in the Plan Area, and differences between alternatives—road miles open to firewood cutters (who remove key habitat components) and trappers on snowmobiles (who pose a mortality risk)—are insufficient to impact fishers one way or the other.

Alternative 1 would retain 367 miles of open wheeled vehicle routes on public land and 425 miles of snowmobile routes.

Alternative 2 would maintain 356 miles of open wheeled vehicle routes on public land and 409 miles of snowmobile routes.

Alternative 3 would maintain 291 miles of open wheeled vehicle routes onpublic land and 407 miles of snowmobile routes.

Alternative 4 would maintain 304 miles of open wheeled vehicle routes and 398 miles of snowmobile routes.

Black-backed Woodpecker

Common Effects of Travel Management

The presence of open roads and motor trails has no direct effect on black-backed woodpecker habitat. Impacts come indirectly from the loss of dead trees to firewood cutting or to Forest operations designed to remove hazard trees from along the roads. Since black-backed woodpeckers are attracted first and

foremost to snag arrays created by stand-replacing fire, roadside snag removal in these environments is the most telling. Woodpecker numbers are much lower in stands created by other agents, even where dead tree abundance is high.

Region 1 habitat models show only a single patch of primary black-backed woodpecker habitat in the Divide landscape—namely, the MacDonald Pass burn (170 acres) from 2009. The ongoing bark beetle onslaught, however, may put the status of black-backed woodpecker habitat in flux. The rapid expansion of open-canopied stands of dead and dying trees across the landscape may be creating new habitat opportunities for black-backed woodpeckers. On the other hand, the strong preference that these woodpeckers show for burned forest snags may mean that the beetle-killed forest would not be exploited by these woodpeckers. Even if blackbacks do move into the beetle-kill, it represents a short-term opportunity, likely to last no more than 10 years as the bark beetles run their course and the woodpeckers' food supply fades away.

But during that time period, even with the likelihood that many snags would be removed by dead tree salvage operations, the loss of snags along roads to firewood cutting would not be a factor in determining whether or not black-backed woodpeckers are able to occupy the landscape. Because of the magnitude of the beetle kill, the fact that the open road corridors would not be available as habitat would be of no real consequence under any travel plan alternative—concentrations of dead tree habitatat would be abundant and widely distributed—a circumstance that has not been extant in the Divide landscape since the turn of the 20th century. This may be a moot point, however, if black-backed woodpeckers continue to spurn the beetle-killed forest.

Alternative 1, No Action

Alternative 1 maintains the status quo. The abundance of dead trees available as potential black back-woodpecker habitat is may be diminished wherever firewood cutters can remove snags from the open road corridors. The degree to which black-backed woodpeckers are actually present in these areas depends upon the character of the environment created by the ongoing bark-beetle infestation of pine forests. This environment is currently a work in progress, and the effect of leaving the existing road system in place is speculative with regard to a species that appears to develop robust populations only in the aftermath of stand-replacing fire.

Alternative 2

Alternative 2 would reduce open roads on public land by nine miles (about 2% of the existing open route system). This represents road corridor that would no longer be available to firewood cutting and removal of roadside hazard trees. The degree to which this would affect black-backed woodpeckers (which have yet to put in appearance in the beetle-killed forest) is highly speculative. It is unlikely that the removal of 9 miles of road corridor from the firewood cutting base would in any measurable way improve prospects for blackbacked woodpeckers.

Alternative 3

Alternative 3 would reduce open roads on public land by 76 miles (roughly 16% of the existing open route system). While this would be an appreciable reduction in the road corridor available to firewood cutters, it is unlikely that it represents a large enough area of concentrated dead tree habitat to produce a commensurate increase in local black-backed woodpecker numbers—especially given their strong preference for burned trees.

Alternative 4

Alternative 4 would reduce open roads on public land by 63 miles (roughly 14% of the existing open route system). As with other action alternatives, this decrease in the availability of non-burned forest to firewood cutting would not meaningfully increase habitat opportunity for black-backed woodpeckers.

Cumulative Effects

This summary is based on the table in *Appendix B*, which identifies past, present, and foreseeable projects and other activities that may affect black-backed woodpeckers and their habitat components. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings), adjacent National Forest lands (HNF Lincoln Ranger District; Beaverhead-Deerlodge NF), and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

The MacDonald Pass Ski Trails and Forest-wide Roadside Hazard Tree Removal projects have both removed beetle-killed mature trees from several hundred acres—although black-backed woodpeckers had not been reported in any of these project sites. The Roadside Hard Tree project is still in progress. Also recently completed are a number of tree removal operations scheduled for campgrounds, picnic areas, and other developed recreation sites (which are unlikely to provide viable black-backed woodpecker habitat). Fire management policy aimed at preventing stand replacing fires over several decades has, in the Divide landscape, resulted in a paucity of black-backed woodpecker habitat. No other Forest Service policies or actions have had meaningful implications for these woodpeckers.

Adjacent Private and Other, Past and Ongoing Actions

Timber harvest on private lands has reduced the potential for a scenario where stand replacing fire would create abundant black-backed woodpecker habitat in those areas.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that could affect black-backed woodpecker habitat revolve around projected salvage projects designed to deal with the ongoing bark beetle epidemic which would remove substantial numbers of dead trees. These include the Telegraph Creek project (which involves both removal of beetle-killed mature trees and the precommercial thinning of sapling conifers in old clearcuts) and the Red Mountain flume Chessman Reservoir project (which involves removing roughly 500 acres of dead trees in the Helena municipal watershed).

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land that could affect blackbacked woodpeckers is tied to salvage of dead trees and thinning projects designed to reduce the probabilty of stand replacing fire.

Conclusions

Differences between alternatives—in terms of road corridor acreage available to firewod cutters—would be too small to impact black-backed woodpeckers, which need extensive concentrations of dead trees to inhabit an area and which have a strong preference for burned forest rather than beetle-killed trees. Given the acreage of beetle-killed pine outside the road corridors, the impact on black-backed woodpecker occupancy would be unsubstantial.

<u>Alternative 1</u> would retain current road corridor acreage on public land from which firewood cutters could remove dead trees that could provide marginal black-backed woodpecker habitat.

<u>Alternative 2</u> would reduce roads on public land available to firewod cutters by nine miles.

<u>Alternative 3</u> would reduce roads available to firewood cutters on public land by 76 miles.

<u>Alternative 4</u> would reduce public roads available to firewood cutters by 63 miles.

Western Boreal Toad

Common Effects of Travel Management

Primary local risk factors for western toads are those that affect breeding habitat via reduction in size and quality of riparian areas. Activities that eliminate key vegetation and increase water turbidity in turn reduce the quality of riparian areas as breeding habitat. Road construction, and the presence of dirt/gravel roads in riparian areas, increases sedimentation in adjacent aquatic habitats if not contained. Off-route motorized use in riparian areas can also reduce habitat by degrading vegetation and increasing sedimentation (Maxell and Hokit 1999).

While toad populations are highest near riparian areas, adult toads travel some distance away from breeding sites, moving through a variety of upland habitats. Because they are small, move slowly and deliberately, and are highly dependent on cover, toads find Forest roads to be more of a barrier than almost any other local wildlife species. In addition to being a deterent to efficient movement through the landscape, well-traveled roads are often a source of mortality for toads and for amphibians and reptiles in general.

Western toads often seek shelter in logs and under other coarse woody debris, and removal of these components from the road corridor—typically by firewood gatherers or by Forest Service burning operations designed to reduce fuel loading—can reduce local habitat opportunity (see additional discussion in sections on *Riparian Habitats*, and *Snag and Woody Debris).*

Alternative 1, No Action

Alternative 1 retains the current configuration of roads and motor trails. This leaves 467 miles of open roads and trails in the travel planning area, 83 miles of which are in riparian habitat conservaton areas (RHCAs). Off-route riding would continue to be restricted by the State-wide OHV Decision (USDA, USDI 2001), which limits off-road vehicle use to a 300 ft corridor on either side of the road for reaching dispersed camping sites and prohibits riding in sensitive habitats (particularly wet sites). A Forest road system of this magnitude, while a contributing factor to depressing local western toad populations, represents a relatively minor impact compared to other decimating factors and sources of habitat degradation (chytrid fungus, draining and diversion of ponds and streams, water pollution, predatory fish introduction, cattle at aquatic sites).

Alternative 2

Alternative 2 would reduce open route mileage from 466 to 457 miles overall and from 83 to 76 miles in riparian habitat conservation areas. This would incrementally reduce mortality risk for western toads, reduce the area from which coarse woody debris is likely to be removed by firewood gatherers, and reduce the miles of roadside riparian habitats likely to be disrupted by motorized use. The result would not be measurable in terms of shifts in local western toad population viability.

Alternative 3

Alternative 3 would reduce open route mileage from 466 to 390 miles overall and from 83 to 69 miles in riparian habitat conservation areas. This would incrementally lower mortality risk for western toads, reduce the area from which coarse woody debris is likely to be removed by firewood cutters, and reduce the miles of roadside riparian habitats likely to be disrupted by motorized use. The decline in potential impacts, though greater than under Alternative 2, would not be measurable in terms of local western toad population viability.

Alternative 4

Alternative 4 is similar to Alternative 3 in terms of its effect on roads and trails in riparian areas. It would reduce open route mileage from 466 to 403 miles overall and from 83 to 70 miles in RHCAs. As with Alternative 3, this would incrementally lower mortality risk for western toads, reduce the area from which

coarse woody debris is likely to be taken for firewood, and reduce potential motorized disruption of roadside riparian habitats. The decline in potential impacts would not be measurable in terms of local western toad population viability.

Cumulative Effects

This summary is based on the table in *Appendix B*, which identifies past, present, and reasonably foreseeable projects and other activities, along with proposed Travel Management, that may affect western toads. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Recent and ongoing activities on the HNF that may negatively affect western toads include: timber sales that have created large openings with minimal coarse woody debris (Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Mullan Pass, Treasure Mountain); retention of grazing allotments on the Forest, most of which allow cattle some degree of access to aquatic habitats; small mining operations; large mining operations on and adjacent to the Forest (Montana Tunnels, Luttrell).

Among smaller projects are the MacDonald Pass ski trail hazard tree project (in productive forest habitat with numerous drainage-head wet sites) and a number of tree removal operations scheduled for campgrounds, picnic areas, and other developed recreation sites (which are unlikely to provide viable western toad habitat).

Actions that have improved prospects for western toads include: revision of allotment management plans that have resulted in lower cattle numbers and range improvements aimed at protecting riparian sites; trail relocation projects that have removed trails from productive riparian areas to upslope locations (Blackfoot Meadows, CDNST); establishment of the Statewide OHV Plan, which prohibits riding off established motor routes except for dispersed camping access; road and motor trail closures associated with timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain); mine site reclamation projects that have reduced sedimentation and pollution at a number of aquatic sites.

Adjacent Private and Other, Past and Ongoing Actions

Development of private lands adjacent to the forest and on inholdings within Forest boundaries has modified riparian and aquatic habitats (by water diversion, sedimentation, degradation of vegetation) and subtracted potential breeding habitat for western toads. Timber harvest on private land has removed forest cover useful to toads, but has often increased the amount of coarse woody debris at ground level—a benefit to toads. Cattle grazing on private ranchlands has led to degradation of riparian/aquatic habitat at many of sites. ATV, trail bike, and 4wd riding in riparian areas disrupts habitat where toad densities are likely to be highest.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that may affect toads to one degree or another include improvement of the Rimini Road, continued grazing allotment revision, and salvage projects designed to deal with bark beetle infestation that may remove or thin understory vegetation and woody debris. Prominent among these are the Telegraph Creek project (which would both remove of beetle-killed mature trees and thin stands of sapling conifers in old clearcuts), the Red Mountain Flume-Chessman Reservoir project (involving dead tree removal and prescribed burning in dead-tree-dominated mature forest), and continuation of the Forest-wide Roadside Hazard Tree Removal Project.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that may affect western toads includes: settlement and associated development of private lands (including road building); timber harvest and removal of beetle-killed trees; continued ATV and other motorized activity; and continued heavy grazing on private ranchlands, including riparian sites.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Given the relatively minor contribution of Forest roads to mortality factors impacting western toads, differences in road miles between alternatives would be highly unlikely to show measurable differences in local toad populations.

Under Alternative 1, 83 miles of road would be retained in Riparian Habitat Conservation Areas (RHCAs).

Under Alternative 2, open road mileage would decline to 76 miles in RHCAs.

Under Alternative 3, open road mileage would decline to 69 miles in RHCAs.

Under Alternative 4, open road mileage would decline to 70 miles in RHCAs.

Flammulated Owl

Common Effects of Travel Management

Flammulated owls are small raptors, active primarily from dusk to dawn. McCallum (1994) observes that they appear quite tolerant of humans: In the northern Rockies, they will nest, roost, and forage close to houses and to open roads and well-used trails if habitat structure is suitable. The mature and old-growth ponderosa pine stands that traditionally provided that habitat structure in the Divide landscape have been logged particularly heavily since the late 1860s—and their relatively low abundance and fragmented dispersion on the landscape are limiting factors for flammulated owls. In these circumstances, the presence of human activity along roads and trails in ponderosa stands, though not an ideal set of conditions, appears not to be a primary determinant of habitat selection. If the basic habitat is there, the owls take advantage of it.

The impact of roads is indirect in that firewood cutters working the open road corridors are likely to remove large dead trees that the owls most often use for nesting. Flammulated owls will nest in live conifers where pileated woodpeckers have excavated cavities, but large snags are the primary source of nest holes—and in the road corridor, they are ephemeral.

The on-going pine beetle epidemic is of particular relevance to flammulated owl habitat, since mature ponderosa pine forests—particularly the more open-grown stands with large trees at lower and mid elevations—represent a primary environment for these birds. The increase in large cavity-prone trees in stands of this structure represents new habitat opportunities for flammulated owls wherever sufficient live canopy remains. In the road corridors, however, the loss of these components is virtually inevitable.

Flammulated owl habitat has been mapped via the Region 1 habitat model, which is designed to predict environments most optimal to flammulated owl nesting, roosting, and foraging. Primary source data for the model has come from research in west-side Forests—notably the Bitterroot, Lolo, and Nez Perece NFs. Field surveys on the HNF suggest that, as with several other species, habitat usage in the drier, more fragmented forests east of the Continental Divide is more diverse. That is, the owls tend to use combinations of necessary habitat components that are variations of the more optimal west-side arrangements—making use of two or three separate habitat patches, each with one optimal component, rather than holding out for a single stand with all components combined. Flammulated owls have also been observed taking advantage of mature aspen stands on the HNF. As a result, the Region 1 model

almost certainly underestimates flammulated owl habitat in the travel planning area. Be that as it may, Table 3.73 summarizes the relative potential for loss of snags to firewood cutting in modeled flammulated owl habitat under different alternatives.

Table 3.73 Potential snag removal zone along open roads in flammulated owl habitat (20,094 acres) in the Divide Travel Plan Area.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Miles of Open Road in Suitable Flammulated Owl Habitat	49 mi	44 mi	40 mi	40 mi
Maximum Acreage of the 600-ft Snag Removal Corridor	3,565 ac	3,200 ac	2,910 ac	2,910 ac
Percent of Suitable Habitat in the 600-ft Snag Removal Corridor	18 %	16 %	14 %	14 %

Alternative 1, No Action

Alternative 1 would have no direct effect on flammulated owls since no new road or trail construction is part of the proposal and no habitat components would be lost as a result. Alternative 1 would maintain the status quo and would not increase the potential for indirect effects resulting from removal of large dead trees that might serve as nesting substrate. Snag removal by firewood cutters and under the proposed HNF hazard tree removal program will increase in the near future because of the proliferation of dead trees generated by ongoing bark beetle infestations. This elevated level of activity, however, is not a function of this alternative.

Alternative 2

There are no direct effects on flammulated owls since, as with Alternative 1, no new road or trail construction is a part of this alternative and no key habitat components would be removed as a consequence. Road closures in Alternative 2 would reduce the maximum roadside area available to snag depletion by firewood cutters in flammulated owl habitat by about 385 acres—or from 18% to 16% of modeled owl habitat.

Alternative 3

Alternative 3 would have no direct effect on flammulated owls since no new road or trail construction is part of proposal and no habitat components would be lost as a result.

Road proposals in Alternative 3 would reduce the roadside area susceptible to snag depletion by firewood cutters in flammulated owl habitat by roughly 669 acres compared to current conditions—from 18% to 14% of modeled owl habitat.

Alternative 4

As with other alternatives, Alternative 4 would have no direct effect on flammulated owls since there would be no new road or trail construction and no resulting loss of habitat components. In terms of its potential for indirect effects on flammulated owl habitat, Alternative 4 is almost identical to Alternative 3. It would reduce the roadside area susceptible to snag depletion by firewood cutting in flammulated owl habitat by about 633 acres compared to current conditions—from 18% to 14% of modeled owl habitat in the travel planning area.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect flammulated owl habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Past timber harvest throughout the Divide landscape, has removed substantial acreages of mature and old-growth forest in which large-diameter conifer snags were prominent components. Timber harvest projects that have had this effect in potential flammulated owl habitat, to one degree or another, include: Mike Renig Gulch–Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Mullan Pass, and Treasure Mountain, among others. Overall, these projects have depleted suitable flammulated owl habitat.

A few recent timber harvest and thinning projects have emphasized retaining large trees in open-grown stands and allowing them to continue to grow in a forest configuration less likely to succumb to stand-replacing fire (Sweeny Creek, Tucker-Dry, Clancy-Unionville). Over the long term, these projects benefit flammulated owl habitat. The MacDonald Pass Ski Trail Hazard Tree Removal Project has removed a substantial number of mature trees, but all were dead, and the area is not in flammulated owl habitat. Portions of the Forest-wide roadside Hazard Tree Removal Project have been in mature ponderosa pine and may have resulted in limited increase in potential flammulated owl habitat (although most surviving trees will not be ponderosa pine).

The ongoing HNF firewood policy that allows members of the public to take up to 10 cords of dead wood within reach of Forest roads continues to result in the removal of most large snags from the road corridors.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development (building construction, clearing, thinning, commercial timber harvest, dead tree salvage) has variable effects. Traditional clearcut logging and overstory removal eliminate potential habitat for flammulated owls; thinning projects—many of them aimed at reducing fuel loading for fire protection—are generally beneficial. Some recent timber harvest on BLM lands (notably in the Sheep Mountain area) have opened up dense ponderosa pine stands, allowing them to develop in more open formations that will eventually be suitable for flammulated owls.

Forest Service Reasonably Foreseeable Actions

Foreseeable activities on HNF land that could affect flammulated owls to one degree or another include the salvage projects designed to deal with the ongoing bark beetle epidemic and that would remove numerous large dead trees, some of which could be of use to flammulated owls. On the other hand, those projects that retain mature trees in open-grown formations are likely to benefit the birds over the long term. The Clancy-Unionville project was originally designed to achieve this forest formation, but extensive beetle kill has required its prescriptions be altered to create more open environments with fewer large trees (many of them now dead). So, this project would be of substantially less benefit than originally intended—at least in the short term. Both the Telegraph Creek and Red Mountain Flume-Chessman Reservoir projects intend to remove dead trees from mature forest over several thousand acres, in some cases resulting in open-grown stands of large residual trees. Almost none of these trees, however, would be ponderosa pine (most will be Douglas-fir, Engelmann spruce, and subalpine fir), and the potential for these forest formations to be occupied by flammulated owls is very low.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that could affect flammulated owl habitat includes settlement and associated development of private lands—often clearing that involves removal of large trees—and clearcut/overstory removal timber harvest and removal of large beetle-killed dead trees.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Flammulated owls are not deterred from nesting near open roads. Removal of dead trees from the road corridor by firewood cutters is unlikely to have any measurable impact on flammulated owl occupancy of the landscape in any alternative: The area of suitable habitat traversed by open roads is relatively modest and the number of large potential nesting snags (ponderosa pine) in the corridor is small.

Alternative 1 would retain 49 miles of open road in potential flammulated owl habitat.

Alternative 2 would reduce open road in potential flammulated owl habitat to about 44 miles.

Alternative 3 would reduce open road in potential flammulated owl habitat to 40 miles.

Alternative 4 would also reduce open road in potential flammulated owl habitat to 40 miles.

Management Indicator Species

Pileated Woodpecker (Old-Growth Dependent Group)

Common Effects of Travel Management

Direct effects associated with the road/trail system arise almost entirely from the loss of components used by pileated woodpeckers when road construction occurs. Since road/trail construction is not part of the Divide travel plan, few, if any, direct effects would result.

Rosenberg and Raphael (2000) found that pileated woodpeckers are associated with forest edges but are moderately intolerant of small forest islands. The association of pileated woodpeckers with edge, however, is based on studies of the juxtaposition of mature forest and clearcuts, not the narrow strip-edges created by Forest roads. These strips do not really create isolated “islands” of forest habitat, and as a result, the “fragmentation” effect of Forest roads should have little or no influence on pileated woodpecker habitat use patterns; nor are the road edges likely to be substantial enough to attract woodpeckers. The effect would be identical for all four alternatives, since it would apply to both open and closed roads.

Virtually all potential effects emerging from the four proposed alternatives would be *indirect*—a result of human use of the road system: road-generated mortality, displacement of woodpeckers from roadside habitat, and loss of roadside snags to firewood cutting.

The potential for vehicle-generated mortality on Forest roads—from birds being hit by or shot from vehicles—is extremely low (no such incidents ever having been reported on the Forest). Therefore, this has been discounted as a meaningful effect.

Research has not demonstrated that pileated woodpeckers avoid otherwise suitable nesting habitat because of the presence of Forest roads, but intuitively, it seems a real possibility—at least in areas immediately adjacent to regularly-used roads. In general, foraging woodpeckers do not appear averse to making use of habitat near open roads if large dead trees are present there (personal observation). But, none of this has been studied in enough detail to be quantified. Vehicle traffic, with its associated noise, vibration, and visual disruption, is the primary problem (Forman *et al.* 2003), and the degree to which

pileated woodpeckers may avoid nesting near roadside habitat is undoubtedly a function of the volume and regularity of vehicle use.

The primary indirect effect generated by all four alternatives would result from the loss of large dead trees in the road corridor to firewood cutting or to Forest Service roadside hazard tree removal projects. Large diameter dead and dying trees are key habitat components for pileated woodpeckers in whatever forest configuration they occur. Mountain pine beetles are in the process of producing numerous large snags within reach of Forest roads throughout Divide pine forests. The larger snags preferred by pileated woodpeckers for nesting and roosting (preferably > 30 inches dbh) occur almost entirely in ponderosa pine stands; they are highly unlikely in lodgepole pine forests. Some may be found in whitebark pine forests, but few, if any of these stands provide pileated woodpecker habitat or are traversed by open Forest roads.

Table 3.74 provides an estimate of the maximum zone available to wood cutters along open roads in modeled pileated woodpecker habitat. It is an over-estimation of the area susceptible to regular snag loss, since the pileated woodpecker habitat model used in Table 3.74 accounts for several forest types, while only the ponderosa pine segment will be producing substantive numbers of large snags in the near future. As well, in many areas, the actual access zone is much narrower than 600 feet, because of subirrigated ground, steep slopes, and other difficult terrain. The table does provide a means, however, of roughly quantifying differences between alternatives with regard to indirect effects on woodpecker habitat.

Table 3.74 Potential snag removal zone along open Roads in modeled pileated woodpecker habitat (59,264 acres) in the Divide Travel Plan Area.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Miles of Open Road in Suitable Pileated Woodpecker Habitat	147 mi	136 mi	123 mi	125 mi
Maximum Acreage of the 600-ft Snag Removal Corridor	10,715 ac	9,860 ac	8,925 ac	9,090 ac
Percent of Suitable Habitat in the 600-ft Snag Removal Corridor	18 %	17 %	15 %	15 %

Alternative 1, No Action

Road proposals in this alternative (which would maintain the current 147 miles of open road in pileated woodpecker habitat) would create no new opportunities for removal of large snags from the road corridor. Snag loss to firewood cutting and under the HNF hazard tree removal program would increase in the near future because of the proliferation of dead trees generated by ongoing bark beetle infestations. No increase, however, would result from implementation of this alternative.

Alternative 2

As with Alternative 1, Alternative 2 would produce no direct effects on pileated woodpeckers as a result of new road construction, since none is proposed. Edge effects from open and closed roads would be identical to those under Alternative 1, and they would be negligible. Road and trail proposals in this alternative would reduce the maximum roadside area available to snag depletion by firewood cutters in pileated woodpecker habitat by about 850 acres.

Alternative 3

As with Alternatives 1 and 2, this alternative would generate no problems for pileated woodpeckers as a result of new road construction, since none is proposed. Road associated edge effects would be identical to those under Alternatives 1 and 2, and they would be negligible. Road and trail proposals in Alternative 3 would reduce the maximum roadside area susceptible to snag depletion by firewood cutters in pileated woodpecker habitat by roughly 1,790 acres compared to current conditions.

Alternative 4

As with previous alternatives, Alternative 4 would create no problems for pileated woodpeckers as a result of habitat components being lost to road construction, since none is proposed. Road associated edge effects would be identical to those under previous alternatives, and they would be negligible. Alternative 4 is similar to Alternative 3 in terms of its indirect effect on potential pileted woodpecker habitat—reducing the roadside area susceptible to snag depletion from firewood cutting by roughly 1,622 acres compared to current conditions.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect pileated woodpeckers and their habitat components. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Past timber harvest in the Divide landscape, has removed a substantial acreage of mature and old-growth forest in which large-diameter conifers were prominent components. Timber harvest projects that have had this effect in pileated woodpecker habitat, to one degree or another, include: Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Mullan Pass, and Treasure Mountain, among others. Overall, these projects have depleted suitable pileated woodpecker habitat.

A few recent timber harvest and thinning projects have emphasized retaining large trees in open-grown stands and allowing them to continue to grow in a forest configurations less likely to succumb to stand-replacing fire (Sweeny Creek, Tucker-Dry). Over the long term, these projects benefit pileated woodpecker habitat. The Clancy-Unionville project was originally designed to achieve this forest formation, but extensive beetle kill has required its prescriptions be altered to create more open environments with fewer large trees (many of them now dead): So, this project is having a mixed effect. The Forest-wide Roadside Hazard Tree project (which is still ongoing) and the MacDonald Pass Ski Trail Hazard Tree Removal project have removed substantial numbers of dead trees—some of them large enough to accommodate pileated woodpecker nesting and many of them large enough to provide foraging substrate.

The ongoing HNF firewood policy that allows members of the public to take up to 10 cords of dead wood within reach of Forest roads continues to result in the removal of most large snags and intact logs from the road corridors.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development (building construction, clearing, thinning, commercial timber harvest, dead tree salvage) has variable effects. Traditional clearcut logging and overstory removal eliminate habitat for pileated woodpeckers; thinning projects—many of them aimed at reducing fuel loading for fire protection—are generally beneficial.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that could affect pileated woodpeckers to one degree or another include salvage projects designed to deal with the ongoing bark beetle epidemic by removing substantial numbers of large dead trees that could be of use to pileated woodpeckers. On the other hand, those projects that retain mature trees in open-grown formations are likely to benefit the birds over the long term. Most prominent among these are the proposed Telegraph Creek and Red Mountain Flume-Chessman Reservoir projects.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that could affect pileated woodpeckers includes settlement and associated development of private lands—often clearing that involves removal of large trees—and clearcut/overstory removal timber harvest and removal of large beetle-killed dead trees.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Differences between alternatives, in terms of road corridor available to firewood cutting, would not be large enough to show up as differences in the ability of pileated woodpeckers to occupy the landscape. Potential nesting trees (ponderosa pine snags >25 inch dbh) that might be removed are rare in the road corridor, and given the proliferation of beetle-killed trees in pine forests across the landscape, nesting habitat will be less limiting than in the past regarless of the alternative selected here.

Under Alternative 1, open roads available to firewood cuttersin pileated woodpecker habitat would remain at about 147 miles.

Under Alternative 2, open roads in pileated woodpecker habitat would decline to 136 miles.

Under Alternative 3, open roads in pileated woodpecker habitat would decline to 123 miles.

Under Alternative 4, open roads in pileted woodpecker habitat would decline to 125 miles.

Forest Plan Consistency

No alternatives propose new road or trail construction. As a result, there would be no habitat modification directly associated with the travel plan. Indirectly, habitat components in the road corridors—primarily snags and logs—would be removed by firewood cutters. This removal would be insufficient to influence local population structure or region-wide viability.

Northern Goshawk (Old-Growth Dependent Group)

Common Effects of Travel Management

Direct Effects

Direct effects on goshawk habitat would include removal of mature forest cover that could prove useful as goshawk nesting habitat. However, no alternatives in the Divide travel plan contemplate removal of mature forest cover. Therefore, this impact does not apply in this case.

Indirect Effects

Indirectly, roads negatively impact goshawk habitat through disturbance associated with the human activity that comes with them. Goshawks are sensitive to human presence near nest sites and can be very aggressive in defending both the nest and the larger area within which newly fledged young are operating (post-fledging family area—the PFA). Goshawks nesting in areas near established roads show a tolerance of existing conditions: primary problems arise from construction of new roads into previously undistured goshawk nesting sites and PFAs—an eventuality not proposed with any of these alternatives. Opening

closed roads to new motorized uses may also create problems for goshawks nesting in the area—and a few such proposals are spread through the action alternatives. Human presence in potential foraging areas (including a variety of conifer forest formations, aspen stands, and forest/grassland edges) is less problematic. Goshawks have frequently been observed killing and feeding on prey near roads, dwellings, and developed recreation sites (although they will temporarily abandon the feeding site if humans approach too closely).

Other indirect effects associated with roads are removal of large snags in the road corridor by firewood cutters and, as is now occurring, by the HNF roadside hazard tree crews. Dead trees provide habitat for cavity nesters, a number of which serve as prey for goshawks. Reynolds *et al.* (1991) considered snags to be a primary component of goshawk nesting and foraging habitat and included them in guidelines for optimal goshawk home ranges.

Table 3.75 summarizes the maximum potential area susceptible to snag removal along open roads. These numbers undoubtedly overestimate the potential area for snag loss since much of the 6oo ft roadside corridor is in rough terrain or other country that prohibits firewood cutters from moving more than a short distance off the road—and that also discourages goshawk nesting. The table does present a mechanism, however, for quantifying and comparing the impacts of the three different alternatives.

Table 3.75 Potential snag removal zone along open roads in goshawk foraging (116,693 acres) and nesting (1,918 acres) habitat in the Divide Travel Plan Area.

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
		Foraging	Habitat	
Miles of Open Road in Suitable Goshawk Foraging Habitat	195 mi	181 mi	162 mi	163 mi
Maximum Acreage of the 600-ft Snag Removal Corridor	14,180 ac	13,185 ac	11,760 ac	11,855 ac
Percent of Foraging Habitat in the 600-ft Snag Removal Corridor	12 %	11 %	10 %	10 %
		Nesting	Habitat	
Miles of Open Road in Suitable Goshawk Nesting Habitat	4.1 mi	4.3 mi	4.0 mi	4.1 mi
Maximum Acreage of the 600-ft Snag Removal Corridor	300 ac	315 ac	290 ac	300 ac
Percent of Nesting Habitat in the 600-ft Snag Removal Corridor	16 %	17 %	15 %	16 %

Alternative 1, No Action

Alternative 1 would retain the existing condition. There would be no direct effects on goshawks since there would be no new road construction tied to implementation of the alternative. As a result, there would be no increased potential for indirect effects resulting from removal of large snags. Snag loss to firewood cutting and the proposed HNF hazard tree program would increase in the near future because of the proliferation of dead trees generated by ongoing bark beetle infestations. This increase, however, would not result from implementation of Alternative 1.

Alternative 2

There would be no direct effects on goshawks since no new road construction is proposed. Road proposals in this alternative would reduce the roadside area available to snag depletion by firewood cutters in goshawk foraging habitat by about 995 acres. In nesting habitat, the potential snag loss zone would increase slightly—by about 15 acres. Alternative 2 would open currently closed road/trail systems that pass through, at least partly, mature forest habitat during the goshawk nesting season in the upper Telegraph, Negro Mountain, and Slate Lake areas. On the other hand, it would impose motorized closures on forested road/trail systems in the Negro Mountain, Sweeny Creek, Priest Pass, and Black Mountain areas that could relieve pressure on nesting goshawks. So, the two sets of actions come close to balancing out.

Alternative 3

There would be no direct effects on goshawks since Alternative 3 promotes no new road construction. Road closures in Alternative 3 would reduce the roadside area susceptible to snag depletion by firewood cutters in goshawk foraging habitat by about 2,420 acres and in nesting habitat by about 7 acres. Alternative 3 would not introduce motorized use into any currently closed road/trail system and would therefore not increase potential disturbance of nesting goshawks. It would close currently open road/trail systems that pass through potential goshawk nesting habitat in the Negro Mountain, Sweeny Creek, Priest Pass, Black Mountain, Spotted Dog, and Kading areas—and thus lower the possibility of motorized disturbance.

Alternative 4

Alternative 4 would have no direct effects on goshawks as no new road construction is proposed. With regard to indirect effects, Alternative 4 is very similar to Alternative 3: Road closures would reduce the roadside area susceptible to snag depletion from firewood cutting in goshawk foraging habitat by about 2,327 acres and would retain the current acreage in nesting habitat. Alternative 4 would impose motorized closures on currently open forested roads and trails in the Negro Mountain, Sweeny Creek, Priest Pass, Black Mountain, and Kading areas during the goshawk nesting season. It would provide somewhat less relief from potential disturbance of nesting goshawks than Alternative 3, but it would not increase the existing potential for disturbance in any area.

Cumulative Effects

This summary of cumulative effects is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and other activities, in addition to proposed Travel Management, that may affect goshawks and their habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described in this summary are common to all alternatives.

Forest Service Past and Ongoing Activities

Past timber harvest in the Divide landscape (mostly by clearcutting) has removed thousands of acres of mature and old-growth forest over the last 30 years, much of which provided nesting and foraging habitat for goshawks. Timber harvest projects that have had this effect, to one degree or another, include: Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Mullan Pass, and Treasure Mountain. For the short- and mid-term, these projects have depleted suitable goshawk habitat.

A few recent timber harvest and thinning projects have emphasized retaining large trees in open-grown stands and allowing them to continue to grow in a forest configurations less likely to succumb to stand-replacing fire (Sweeny Creek, Tucker-Dry). These projects eliminate goshawk nesting habitat but retain foraging habitat. The ongoing Clancy-Unionville project in the Lump Gulch, Quartz Creek, and Buffalo Creek drainages, originally designed to produce open-grown foraging habitat, will no longer be able to

achieve this end because of intense insect-generated tree mortality: This project will now have a mixed effect depending on the representation of Douglas-fir, which is not susceptible to the pine beetles. Projects designed primarily to remove dead beetle-killed trees have lowered, somewhat, the suitability of potential goshawk foraging habitat, but have not influenced nesting stands, as the beetle-induced defoliation has already eliminated nesting potential. These projects include the Forest-wide Roadside Hazard Tree Removal Project., the MacDonald Pass ski trail hazard tree project, and a number of tree removal operations in campgrounds, picnic areas, and other developed recreational sites.

The ongoing HNF firewood policy that allows members of the public to take up to 10 cords of dead wood within reach of Forest roads continues to result in the removal of most large snags and intact logs from the road corridors.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development (building construction, clearing, thinning, timber harvest, dead tree salvage) has variable effects. Traditional clearcut logging and overstory removal, eliminate potential goshawk habitat; thinning projects—many of them aimed at reducing fuel loading for fire protection—may retain foraging habitat over the long term.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that could affect goshawks to one degree or another include salvage projects designed to deal with the ongoing bark beetle epidemic, which would remove substantial numbers of large dead trees that could continue as components of goshawk foraging habitat. The effect, as related to the salvage cutting, would be of short duration, since the dead trees would fall of their own accord within a few years, reducing the suitability of the habitat for goshawks. Any of these projects that are able to retain mature trees in open-grown formations are likely to retain long-term foraging habitat. Current dead tree harvest proposals include the Telegraph Creek and the Red Mountain Flume-Chessman Reservoir projects.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that could affect goshawks includes continuing timber harvest on private, State, and BLM lands—dominated by thinning for fire protection and salvage of beetle-killed dead trees.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Effects under all alternatives would be indirect and rather unsubstantial—arising from loss of snags and woody debris in the road coridor to firewood gatherers. This would represent a loss of habitat structure for potential prey species. Differences between alternatives are insufficient to be reflected in different levels of local goshawk occupancy.

<u>Alternative 1</u> would retain 4.1 miles of open road in goshawk nesting habitat and 195.0 miles in foraging habitat.

<u>Alternative 2</u> would maintain 4.3 miles of open road in goshawk nesting habitat and 181.3 miles in foraging habitat.

<u>Alternative 3</u> would maintain 4.0 miles of open road in goshawk nesting habitat and 161.7 miles in foraging habitat.

<u>Alternative 4</u> would maintain 4.1 miles of open road in goshawk nesting habitat and 163 miles in foraging habitat.

Forest Plan Consistency

No alternatives propose new road or trail construction. As a result, there would be no habitat modification directly associated with the travel plan. Indirectly, habitat components in the road corridors—primarily snags and logs—would be removed by firewood cutters. This removal would be insufficient to influence local population structure or region-wide viability.

Hairy Woodpecker (Snag-Dependent Species)

Common Effects of Travel Management

Hairy woodpeckers are directly impacted by the road/trail system when new road construction eliminates key habitat components—namely, dead, dying, and other insect-prone trees. However, none of the Divide travel plan alternatives include construction of new motorized routes. Therefore, there would be no direct effects from this source.

All effects under proposed alternatives would be indirect: dead trees in the open road corridors would be lost to firewood cutting and to roadside hazard tree removal by Forest Service crews. Bark beetle infestations are in the process of producing an abundance of snags within reach of Forest roads throughout Divide pine forests. For hairy woodpeckers, already relatively common in the landscape, this is an expansive habitat opportunity throughout all pine forests at all elevations, and these birds are likely to proliferate over the next 15-20 years.

Table 3.76 estimates the acreage of roadside corridors available to firewood cutters in 2 delineations of hairy woodpecker habitat: (1) *optimal nesting* habitat, as estimated by the Region 1 habitat model, and (2) *mature forest* habitat in general. The Region 1 model presents a more narrow construct of hairy woodpecker habitat—focusing on mature forest stands (with overstory trees >10 inches dbh) of sparse/intermediate density (<50% canopy closure) with numerous dead trees (at pre-beetle outbreak levels). Stands of this sort provide ideal nesting and foraging habitat for hairy woodpeckers. However, this model appreciably underestimates the reach of suitable hairy woodpecker habitat in the Divide landscape. In fact, hairy woodpeckers appear in virtually all forested habitats on the HNF other than seedling/sapling stands devoid of residual snags. Although they are most common in environments with a plethora of dead and dying trees, they are often seen in stands that appear relatively healthy, as long as enough insect-supporting trees are present. They also forage in stands dominated by pole-sized trees, although they may be unable to nest there. As bark beetle infestation continues, much of the general "mature forest habitat" tallied in Table 3.76 will convert to "optimal habitat" (the optimal habitat in this table representing pre-beetle circumstances).

Table 3.76 Potential snag removal zone along open roads in hairy woodpecker habitat (16,048 acres) in the Divide Travel Plan Area.

	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**
Miles of Open Road in *Optimal* Hairy Woodpecker Habitat	43 mi	41 mi	36 mi	37 mi
Miles of Open Road in *Mature Forest* available to Hairy Woodpeckers	294 mi	260 mi	233	235 mi
Acreage of the 600-ft Snag Removal Corridor in *Optimal* Habitat	3,149 ac	2,982 ac	2,633 ac	2,690 ac
Acreage of the 600-ft Snag Removal Corridor in *Mature Forest* Habitat	21,300 ac	18,900 ac	16, 970 ac	17,091 ac

Alternative 1, No Action

There would be no direct effect on hairy woodpeckers since no new road or trail construction is proposed in this alternative and no snag habitat would usurped by direct actions connected with maintaining the staus quo.

Road and trail proposals in this alternative (which maintain the status quo) would generate no new potential for removal of large snags. Snag removal by firewood cutters and under the proposed HNF hazard tree removal program would increase along existing open roads in the near future because of the proliferation of dead trees generated by the ongoing bark beetle infestation. This increase, however, would not result from implementation of this alternative.

Alternative 2

Alternative 2 would generate no direct effects on hairy woodpeckers as no new roads or trails are proposed. Proposals in this alternative would reduce the roadside area susceptible to snag depletion by firewood cutting in modeled hairy woodpecker habitat by about 165 acres and in mature forested habitat in general by arout 2,400 acres. This would be an indirect effect.

Alternative 3

There would be no direct effects on hairy woodpeckers since no new road or trail construction is proposed in Alternative 3. Road and trail proposals in Alternative 3 would reduce the current roadside area susceptible to snag depletion by firewood cutters by about 515 acres in modeled hairy woodpecker habitat and by about 4,330 acres in mature forest habitat in general.

Alternative 4

Alternative 4 would generate no direct effects on hairy woodpeckers since no new road or trail construction is proposed. Reduction in the area susceptible to snag depletion by firewood cutters would be somewhere between that provided by Alternative 2 and Alternative 3: a decline of about 459 acres in modeled hairy woodpecker habitat and about 4,209 acres in mature forest habitat in general.

Cumulative Effects

This summary is based on the table in *Appendix B*, which identifies past, present, and reasonably foreseeable projects and other activities, in addition to travel management, that may affect hairy woodpecker habitat components. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and adjacent lands (private, State, County, Municipal, and BLM). Effects described are common to all alternatives.

Forest Service Past and Ongoing Activities

Timber harvest over the past 30 years, primarily via clearcutting and other regeneration harvest methods, has removed substantial acreages of hairy woodpecker habitat. Residual snags in some of these areas have continued to support woodpeckers, but, overall, the habitat quality has declined. Timber projects that have had this effect include: Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Mullan Pass, and Treasure Mountain, among others.

A few recent timber harvest and thinning projects have emphasized retaining large trees, as well as snags, in open-grown stands and allowing them to continue to grow in forest formations less likely to succumb to stand-replacing fire (Sweeny Creek, Tucker-Dry). Over the long term, these projects benefit hairy woodpeckers. The ongoing Clancy-Unionville project in the Lump Gulch, Quartz Creek, and Buffalo Creek drainages, originally designed to harvest green trees, is now focused primarily on removing dead trees. Although much hairy woodpecker habitat will remain, the result will be considerably less favorable to them than the original pre-beetle vision.

Recent and ongoing activities on the National Forest that have improved prospects for snags and consequent habitat opportunity for hairy woodpeckers are the road closures associated with a number of timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain, Lava Mountain), which limit roadside firewood cutting. These projects have all adhered to *Forest Plan* standards for retaining snags and replacement snags. In some cases, decisions not to pursue potential salvage opportunities (Jericho Mountain, Snowshoe Creek, MacDonald Pass burn) have resulted in retention of large blocks of snags.

A number of projects have removed substantial numbers of beetle killed trees, thus locally reducing nesting and foraging habitat for hairy woodpeckers. These include the Forest-wide Roadside Hazard Tree Removal project (which is still ongoing), the MacDonald Pass ski trail hazard tree project (in productive forest habitat just below the Divide), and a number of tree removal operations scheduled for campgrounds, picnic areas, and other developed recreation sites (areas used by hairy woodpeckers).

Recent Carbaryl spraying of campgrounds and other administrative sites (Cromwell Dixon campground, MacDonald Pass trailhead) has been intended to prevent large trees from dying in areas of concentrated public use. This enterprise has met with limited success and thus has not been a major factor in suppressing snag creation.

The ongoing policy of allowing public firewood cutting on the National Forest is the primary factor driving the removal of most large snags from Forest road corridors. Ongoing efforts by the HNF to limit the potential safety hazard posed by large numbers of dead trees in areas frequented by the public have accelerated the process of snag loss in road corridors and other accessible sites. These actions have also reduced the number of snags available to firewood cutters. Hazard tree removal projects have recently been completed or are going forward at a number of campgrounds (Cromwell Dixon, Moose Creek, Kading, Park Lake), day-use areas (Moose Creek, MacDonald Pass), trailheads (MacDonald Pass CDNST), administrative sites (Moose Creek ranger station, Kading cabin), as well as along open Forest roads.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development—particularly clearing, thinning, commercial timber harvest, and dead tree salvage has had variable effects. Traditional clearcut logging and overstory removal, eliminate most habitat components for hairy woodpeckers; thinning projects—many aimed at reducing fuel loading for fire protection—preserve some habitat, but generally lower suitability because of the elimination of dead and dying trees.

Forest Service Reasonably Foreseeable Actions

The most prominent foreseeable activities on HNF land that could affect hairy woodpeckers to one degree or another are salvage projects designed to deal with the ongoing bark beetle epidemic—removing substantial numbers of dead trees that could be of useful habitat components. On the other hand, those projects that retain mature trees in open-grown formations are likely to benefit the woodpeckers over the long term. Current proposals include the Telegraph Creek project (which involves both removal of beetle-killed mature trees and the precommercial thinning of sapling conifers in old clearcuts and the Red Mountain Flume-Chessman Reservoir project (which involves cutting dead trees, thinning green trees, and burning slash to protect infrastructure in the Helena municipal watershed).

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that could affect hairy woodpeckers includes settlement and associated development of private lands that involves timber harvest and removal of beetle-killed dead trees.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

The only effects on hairy woodpeckers would be indirect—resulting from removal of dead trees from the road corridors by firewood cutters. Given the vast acreage of snags being created by bark beetles across the landscape, losses in the road corridor would be inconsequential, and differences between alternatives, in terms of woodpecker numbers, would be undetectable.

Alternative 1 would retain 43 miles of open road in optimal hairy woodpecker habitat and 294 miles in mature forested habitat that the woodpeckers may also use.

Alternative 2 would maintain 41 miles of open road in optimal hairy woodpecker habitat and 260 miles in mature forested habitat.

Alternative 3 would maintain 36 miles of open road in optimal hairy woodpecker habitat and 233 miles in mature forested habitat.

Alternative 4 would maintain 37 miles of open road in optimal hairy woodpecker habitat and 235 miles in mature forested habitat.

Forest Plan Consistency

No alternatives propose new road or trail construction. As a result, there would be no habitat modification directly associated with the travel plan. Indirectly, habitat components in the road corridors—primarily snags and logs—would be removed by firewood cutters. This removal would be insufficient to influence local population structure or region-wide viability.

Marten (Mature Forest Dependent Species)

Common Effects of Travel Management

Indirectly, roads negatively impact marten habitat by providing access routes for firewood cutters, who remove snags and logs. Snags and coarse woody debris (stumps, logs, and large woody fragments) provide critical habitat components for marten foraging, resting, and denning (Spencer 1987; Buskirk *et al.* 1989; Coffin 1994).

Roads also facilitate trapping. Trapping affects marten populations by altering the sex and age structure, disproportionately capturing juveniles and males, as well as lowering local population density (Hodgman *et al.* 1994). In some drainages marten can be completely eliminated (at least in the short term) by persistent trapping. Roads in forested areas increase trapping pressure on marten and result in higher capture rates in roaded versus unroaded areas. Thompson (1994) found that the increased impacts of trapping in logged sites as opposed to unlogged areas were a direct result of the higher road densities generated by logging operations (and the access provided primarily to trappers on snowmobiles).

Table 3.77 summarizes miles of road in marten habitat that may contribute to dead tree/log removal and to trapping—an indirect effect. These are maximum areas: substantial portions of the 600-ft corridors are actually inaccessible to firewod cutters or are not seen as profitable locations by trappers.

Table 3.77 Potential snag removal zone along open roads in American marten habitat (145,653 acres) in the Divide Travel Plan Area.

	Alt.1	**Alt. 2**	**Alt.3**	**Alt. 4**
Miles of Open Road in Suitable Marten Habitat	294 mi	260 mi	233 mi	235 mi
Maximum Acreage of the 600-ft Snag Removal Corridor	21,295 ac	18,895 ac	16,965 ac	17,090 ac

	Alt.1	Alt. 2	Alt.3	Alt. 4
Percent of Suitable Habitat in the Maximum Snag Removal Corridor	15 %	13 %	12 %	12 %

Alternative 1, No Action

Maintaining the status quo under Alternative 1 would have no direct effect on marten habitat since there would be no mandate to construct new road. Likewise, there would be no increase in the potential for indirect effects resulting from removal of large snags. Snag removal in the road corridors by firewood cutters and under the proposed HNF hazard tree removal program would increase in the near future because of the proliferation of dead trees generated by ongoing bark beetle infestations. This increase, however, is not a function of this alternative.

Alternative 2

There would be no direct effects on marten since there would be no new road or trail construction. Road and trail proposals in this alternative would reduce the roadside area available to snag depletion by firewood cutters in marten habitat by about 2,400 acres.

Alternative 3

There would be no direct effects on marten since no new road or trail construction is part of this alternative. Road and trail proposals in Alternative 3 would reduce the roadside area susceptible to snag depletion by firewood cutters in marten habitat by about 4,330 acres compared to current conditions.

Alternative 4

As with other action alternatives, Alternative 4 would generate no direct effects on marten since it would involve no new road or trail construction. Road and trail proposals in Alternative 4 would reduce the roadside area susceptible to snag depletion by firewood cutters in marten habitat by about 4,205 acres compared to current conditions.

Cumulative Effects

This summary is based on the table in *Appendix B*, which identifies all past, present, and reasonably foreseeable projects and activities, in addition to proposed Travel Management, that may affect marten and marten habitat. The scope of the analysis includes the Divide landscape (HNF land with non-Forest inholdings) and immediately surrounding lands (private, State, County, Municipal, and BLM). Effects described here are common to all alternatives.

Forest Service Past and Ongoing Activities

Past timber harvest throughout the Divide landscape, has removed substantial acreages of mature and old-growth forest capable of providing primary marten habitat—particularly projects that have intruded into riparian forest. Timber harvest projects that have had this effect, to one degree or another, include: Bison Mountain, Ontario Creek, Mike Renig Gulch-Hahn Creek, Slate Creek, Deadman, Strawberry, Corral Gulch, Buffalo Creek, Sound Wood, and Treasure Mountain, among others.

Primary actions that have locally reduced the effectiveness of potential marten habitat by providing access for trappers and firewood cutters include retention of groomed snowmobile trails and roads passing through forested riparian habitat.

Actions that have improved prospects for marten include: closure of Inventoried Roadless Areas to snowmobile use (Electric Peak, Lazyman); trail relocation projects that have removed trails from productive riparian areas to upslope locations (Blackfoot Meadows, CDNST); establishment of the Statewide OHV Plan, which prohibits riding off established motor routes; and road and motor trail

closures associated with timber harvest projects (Clancy-Unionville, Sound Wood, Mullan Pass, Treasure Mountain) that have measurably expanded blocks of non-motorized habitat.

The impact of recent projects to remove dead trees (and future coarse woody debris) from potential marten habitat is unclear, and depends on the degree to which marten are willing to make use of deadfall accumulations in the absence of overhead canopy. If they use these areas of open woody debris, then the projects have removed suitable habitat; if not, then the projects have probably had little effect. These projects include the Roadside Hazard Tree Removal and MacDonald Pass Ski Trails projects. Operations that have removed dead trees from developed recreation and administrative sites have probably had little effect, since they have generally been unsuitable as marten habitat.

Adjacent Private and Other, Past and Ongoing Actions

Recent and ongoing private land development (building construction, clearing, thinning, commercial timber harvest, dead tree salvage) will continue to impact potential marten habitat, particularly where it occurs in forested riparian areas. Actions that reduce key habitat components—large snags and logs, and overhead cover—could have an effect.

Forest Service Reasonably Foreseeable Actions

Reasonably foreseeable activities on HNF land that could affect marten to one degree or another include salvage projects designed to deal with the ongoing bark beetle epidemic which, if implemented, would remove substantial numbers of large dead trees that could be of use to marten. As noted above, the degree to which such efforts affect marten is dependent upon how willing the animals are to make use of uncanopied accumulations of coarse woody debris. Prominent among foreseeable projects are the Red Mountain Flume-Chessman Reservoir and Telegraph Creek projects.

In addition, travel planning efforts underway on adjacent Forests, as well as the Lincoln Ranger District on the HNF, could be beneficial to marten if they provide local sanctuaries free from motorized access. Because marten are capable of traveling some distance, better habitat conditions on other Forests could improve marten populations and subsequent dispersal opportunities to the Helena National Forest. Conversely, travel management decisions elsewhere could reduce marten populations in those areas and reduce the potential for emigration/immigration. Travel planning efforts on the Lincoln Ranger District include the Blackfoot Travel and Blackfoot Winter Travel projects.

Adjacent Private and Other, Reasonably Foreseeable Actions

Future activity on non-Forest land within the cumulative effects area that could affect marten includes: settlement and associated development of private lands and timber harvest and removal of large beetle-killed dead trees.

Conclusions

Information in this section is summarized in tabular form in *Appendix C*.

Effects on marten stem from removal of snags and woody debris from the road corridor by firewood cutters and from routes available to trappers on snowmobiles. Given the acreage of snags being created by bark beetles across the landscape, losses in the road corridor would be relatively minor, and differences between alternatives, in terms of marten numbers, would not be measurable. Trapper access along established snowmobile routes in marten habitat would be essentially the same for all alternatives.

<u>Alternative 1</u> would retain 294 miles of open road in suitable (modeled) marten habitat.

<u>Alternative 2</u> would maintain 260 miles of open road in suitable marten habitat.

<u>Alternative 3</u> would maintain 233 miles of open road in suitable marten habitat.

<u>Alternative 4</u> would maintain 235 miles of open road in suitable marten habitat.

Forest Plan Consistency

No alternatives propose new road or trail construction. As a result, there would be no habitat modification directly associated with the travel plan. Indirectly, habitat components in the road corridors—primarily snags and logs—would be removed by firewood cutters. This removal would be insufficient to influence local population structure or region-wide viability.

Marten are directly influenced by road density. However,no alternative would increase road density, and the three action alternatives would decrease it.

Local Effects in Key Areas

Introduction

Area Selection and Delineation

This section addresses the effects of proposed road and trail management on nine specific sites in the Divide landscape. Travel management proposals for these areas have generated much discussion within the HNF, between the Forest and the public, and between user groups. A central aspect of the discussion, in many cases, has been the impact of roads and motorized uses on wildlife and wildlife habitat—and the complexities of accommodating wildlife while allowing for public access in these "key areas" has driven many of the differences between alternatives. Proposals for other parts of the planning area also differ between alternatives but have generated less comment and controversy. Key areas have been circumscribed by whatever boundaries worked to pragmatically encompass the reach of the local road and trail systems in question: administrative boundaries, section lines, major roads, and obvious physical features.

Open Road and Motor Trail Summary

Table 3.78 summarizes differences between alternatives with regard to miles of open road and motorized trail in a number of key local areas.

Table 3.78 Miles of road and motorized trail open (at any time of year) in key/controversial areas

Key Area ID	Area (mi^2)	Miles of Open Roads & Motor Trails							
		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		open roads	motor trails	open roads	motor trails	open roads	motor trails	open roads	motor trails
Spotted Dog Crk – Baldy Ridge – Kading	12.1	18.2	7.4	18.2	4.5	1.0	0	8.8	0
Negro Mountain	7.2	12.0	0.6	16.2	0	11.8	0	14.5	0
Upper Telegraph Crk	5.8	7.7	0.5	13.0	0	6.7	0	7.5	0
Ontario Crk – Bison Crk	8.8	4.1	0	4.1	2.6	4.1	0	4.1	2.6
Hahn Crk – Flume Gulch – Mike Renig Gulch	8.9	11.2	0	14.6	0	10.6	0	10.6	0

Key Area ID	Area (mi²)	Miles of Open Roads & Motor Trails							
		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		open roads	motor trails	open roads	motor trails	open roads	motor trails	open roads	motor trails
Slate Crk – Elliston Crk	6.5	4.5	0	8.3	2.2	4.5	0	4.5	0
Lower Sweeny Crk – Blue Cloud	4.0	2.2	11.7	2.2	10.6	0.6	0	0.6	0
Priest Pass	7.0	7.9	1.0	7.7	0	5.1	0	5.1	0
Black Mountain – Meyers Hill – Ophir Crk	9.9	5.7	5.6	3.7	0.6	3.7	0	3.7	0.6

Table 3.79, below, converts the mileages shown in Table 3.78 to local road and trail densities. The densities are meant for local comparison among key areas only, and not for determining habitat effectiveness or open road/hiding cover ratios for Forest Plan standards.

Table 3.79 Open road and motor trail density (mi/mi²) in key wildlife areas

Key Area ID	Area (mi²)	Density of Open Roads & Motor Trails (mi/mi²)							
		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		open roads	motor trails	open roads	motor trails	open roads	motor trails	open roads	motor trails
Spotted Dog Crk – Baldy Ridge – Kading	12.1	1.5	0.6	1.5	0.4	0.1	0	0.7	0
Negro Mountain	7.2	1.7	0.1	2.2	0	1.6	0	2.0	0
Upper Telegraph Crk	5.8	1.3	0.1	2.2	0	1.2	0	1.3	0
Ontario Crk – Bison Crk	8.8	0.5	0	0.5	0.3	0.5	0	0.5	0.3
Hahn Crk – Flume Gulch – Mike Renig Gulch	8.9	1.2	0	1.6	0	1.2	0	1.2	0
Slate Crk – Elliston Crk	6.5	0.7	0	1.3	0.3	0.7	0	0.7	0
Lower Sweeny Crk – Blue Cloud	4.0	0.6	2.9	0.6	2.6	0.2	0	0.2	0
Priest Pass	7.0	1.1	0.1	1.1	0	0.7	0	0.7	0

Key Area ID	Area (mi²)	Density of Open Roads & Motor Trails (mi/mi²)							
		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		open roads	motor trails	open roads	motor trails	open roads	motor trails	open roads	motor trails
Black Mountain – Meyers Hill – Ophir Crk	9.9	0.6	0.6	0.4	0.1	0.4	0	0.4	0.1

Area Characteristics, Wildlife Issues, and Comparison of Alternatives

Spotted Dog Creek – Baldy Ridge – Kading

Area Characteristics and Wildlife Issues

This wide-reaching, though often primitive, road/trail network covers the big ridge (Baldy Ridge) between the Little Blackfoot River road to the east (in the vicinity of Kading campground) and the upper reaches of Spotted Dog Creek to the west. The segment of the ridge at issue covers roughly 7,500 acres (down to the drainage bottoms on either side) and supports an established road/trail network of about 35 miles, in addition to several miles of ephemeral pioneered motor tracks. The current motor route density [10] (for routes open all or part of the year) is relatively high at 2.1 mi/mi². Most vehicle traffic is concentrated along the Little Blackfoot River road (a wide, graded road) around Kading campground on the southeast periphery of the area. Heaviest use of the road/trail system occurs in the hunting season, although use is often tempered by inhospitable snow conditions later in the season. Summer use consists of weekend excursions by ATVs, motor bikes, and a few highway vehicles, as well as occasional forays by grazing permittees, recreational miners, MFWP biologists, and HNF field personnel.

Baldy Ridge is characterized by extensive dry grasslands interspersed with patches of timber—mostly Douglas-fir and lodgepole pine. More contiguous forest cover extends down both the east and west slopes. Broadscale MFWP maps show much of the area as elk "winter range"—a classification based on elk observations that extend to June 1. In fact, elk have not been observed on the ridge during the winter in the last 3 decades for which we have records. Elk generally begin to move up into the open grasslands in April or early May and remain through the summer and as much of the fall hunting season as snow depths allow. Since 1995, a series of local wolf packs that have denned in Spotted Dog Creek have included the Baldy Ridge country as a primary part of their territories. Likewise, in the last decade, grizzly bears have been reported in this general area—though rarely—and lynx and wolverines have been reported nearby.

There is no short, easy route from the Helena area and Highway 12 to the upper reaches of Baldy Ridge, and as a result, human presence has remained relatively spare and fleeting in spite of high road/trail density. Primary wildlife objectives are to minimize overt human disturbance on big game summer range (including spring calving areas and late summer/early fall rutting sites) and to retain reasonable security for elk and deer during the hunting season. Maintaining these characteristics also benefits other species of concern—primarily the large carnivores. The presence of snowmobiles in winter is not of major concern.

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[10] Road densities throughout this section apply only to the localized areas under consideration: they are not applicable to surrounding elk herd units or other larger units used to determine compliance with *Forest Plan* standards and guidelines.

Alternative 1, No Action

This alternative would maintain the current network of over 18 miles of open road and 7 miles of motor trail (local open route density = 2.1 mi/m²). With the exception of a short section of the Little Blackfoot River Road (#227) on the southeastern flank and portions of Forest system roads in the Spotted Dog drainage on the west side (#314-j1 and #314-j3), most of the roads are rough 4wd routes. The only viable connecting routes from the Spotted Dog drainage to the west (#314 and #MTR-1868) and along the ridge from the north are closed from September 1 to May 15, eliminating motorized access from that direction for the entire hunting season. However, the motor trail system coming up out of the Kading area from the east provides year-round access for vehicles less than 50 inches wide (although larger 4wd vehicles sometimes manage to negotiate Trail #501). Most of the area is protected by a hunting season snowmobile closure. So, between the rough, limited motorized access and later-season snow conditions, fall elk security in this area is reasonably good, and would remain so under Alternative 1.

Primary problems in summer arise from OHVs of all kinds riding off-route across the grasslands and pioneering new routes through a variety of habitats. While this is not allowed under the Montana-Dakota Cross-Country Driving regulations (2001), the remoteness of this area makes enforcement difficult, and the situation is likely to continue under Alternative 1. In particular, OHV riders have forged a route that connects the end of road #314-J3 in Spotted Dog with the road system atop Baldy Ridge. The Spotted Dog road had been gated (and marked as closed yearlong) until recently, when gates have been left open, allowing the creation of the new user-made trails. Another prominent user-made motor trail extends from the Limburger Springs area southward to the steep route coming up the Kading Grade (#MTR-502).

The two primary snowmobile routes crossing the area on existing roads and motor trails would be retained, and off-route snowmobiling on those portions of the open ridge not wind-blown and bare would be allowed after December 1. This use occurs during a period when elk are not present and bears are not active. Lynx and other winter carnivores may make use of the packed snowmobile trails, but no negative encounters have been reported and the trails do not appear to be creating any notable problems for local wildlife.

Alternative 2

Alternative 2 would maintain a local open road/motor trail density of about 1.9 mi/mi²—somewhat less than Alternative 1—and it would make a number of changes in route designations and seasonal restrictions. The only existing motorized route eliminated would be the trail running up to the ridgetop from Kading cabin. This would be converted to a foot trail, thereby eliminating all motorized disturbance on the 3 mi² southeast slope above the Kading area of the Little Blackfoot (between trails #MTR-502 and #501).

Several changes apply to the hunting season. Roads in upper Spotted Dog Creek currently closed during the big game rifle season (#314-J1, #314-J-3) would now be open during that time. Neither of these routes provides a loop driving opportunity or motorized access to the upper ridge. All rifle season vehicle access to upper Baldy Ridge would be eliminated under Alternative 2. Existing restrictions on roads/trails #MTR-1868, #314, and the #314 connector to the north would be retained and, in addition, the 2 remaining motor trails coming up from the east side would be closed to vehicles from October 15 to May 15. In all cases, hunting season vehicle restrictions would begin on October 15 (just before the big game rifle season), rather than on September 1 as with some of the routes now. This would allow ATV and motor bike use to continue through the fall riding season, although it may interfere with bow hunting opportunity (beginning September 1) for some hunters. Under Alternative 2, the area would be open to snowmobiles any time snow conditions allow between December 2 and May 15 (although, typically, snowmobiling conditions deteriorate badly toward the end of March).

Alternative 3

The only local route open to wheeled vehicles that would be retained under this alternative is the Little Blackfoot River road (#227) north of Kading campground along the eastern edge of the area. All other motor routes along the Little Blackfoot, on Baldy Ridge, and in upper Spotted Dog Creek would be eliminated or converted to non-motorized uses. The resulting open road/motor trail density would be 0.1 mi/mi². As in the other three alternatives, existing snowmobile routes would be retained. But, aside from the snowmobile season (typically early December through late March), Alternative 3 would expand the size of the large elk security area centered in the roadless area by roughly one third. In terms of providing an undisturbed environment for wildland species for much of the year, this is the most effective of the four alternatives.

Alternative 4

Alternative 4 is identical to Alternative 3 with regard to motor trails: there would be none. But, whereas Alternative 3 would support only 1.0 mile of open road (along the eastern boundary of the area, with no motorized access to Baldy Ridge), Alternative 4 would provide wheeled vehicles a driving route up onto the ridge from Spotted Dog Creek via a 6.1 mile segment of Road #314. The route would be open to wheeled vehicles from mid May to mid October (and thus closed to them through the big game rifle season and much of the spring). Local open route density would be 0.7 mi/mi² from late spring though early fall. As with the other alternatives, the road (along with the ridgetop road) would be open to snowmobiles after December 1; and while, technically, snowmobiling would be allowed to continue until May 15, the routes usually become too threadbare for snow machines by the end of March. Baldy Ridge would thus be devoid of vehicle traffic from late March/early April through mid-May—the key period when elk and deer are beginning find their way back up to the ridge with spring green-up and when bears are emerging from hibernation. Alternative 4 is somewhat less effective than Alternative 3 in providing an undisturbed environment for wildlife but considerably more effective than Alternatives 1 and 2.

Conclusions

Alternative 1 would maintain a local open road/motor trail density of about 2.1 mi/mi² in summer—but with some of these routes closed in hunting season—including the bow season in September and early October. Existing snowmobile routes would be the same in all alternatives.

Alternative 2 would reduce summer open route density to 1.9 mi/mi². It would also reduce motorized access to Baldy Ridge during the big game rifle season—although the current bow season closures would be eliminated.

Compared to Alternatives 1 and 2, Alternative 3 would dramatically decrease all motorized access to Baldy Ridge throughout the year (open route density = 0.1 mi/mi²), making it, in essence, a northward extension of the Electric Peak Roadless Area to the south in spring, summer, and fall.

Alternative 4, with a summer open route density of 0.7 mi/mi² and all routes closed during the big game rifle season, would be closer to Alternative 3 than to Alternatives 1 and 2.

All four alternatives would contribute to adequate rifle season elk security, but Alternative 2 would improve on the status quo and Alternatives 3 and 4 more so. Alternative 3 would provide by far the best summer habitat effectiveness. Wolves and grizzly bears are sometimes in the area, and Alternative 3 would be the best option for insulating these species from human interference. Alternative 4, with no motor trails and only one ridge road open in summer would be very effective in this regard as well. Winter snowmobiling should not be a problem for wildlife as long as current use patterns do not escalate in some unforeseen way.

Negro Mountain

Area Characteristics and Wildlife Issues

The Negro Mountain road system is bounded by the main stem of the Little Blackfoot River to the west and northwest, Telegraph Creek to the east and northeast, and Treasure Mountain to the south. Most of the road system is on the Telegraph Creek side of the Negro Mountain divide. The extensive road network north of Negro Mountain was constructed for the Treasure Mountain timber sale in the late 1980s, and much of it is off-limits to motor vehicles year-round in order to maintain big game habitat effectiveness and security (as per a 1988 negotiated appeal settlement). The remainder of the system to the south and east consists of an assortment of roads open year-long, seasonally, or not at all—in addition to several non-system and user-made routes. This adds up to 12.0 miles of Forest system road open at least part of the year and a local open road density of 1.7 mi/mi². While OHV riders have pioneered a number of transient motor trails throughout the area, there is only one recognized (numbered) user-made trail (0.7 mile). All open routes are available to snowmobiles in winter. Most of the road closures in this area are designed to insulate big game habitat.

While much of the area between the Little Blackfoot River and Telegraph Creek is covered by mature and early-seral forest, the Negro Mountain ridge supports a variety of open grassland habitats ranging from forest openings of a few acres to extensive parks covering several hundred acres. Elk migrate up into this cover/forage mosaic in mid spring, some of them calving here and a few spending the summer. A number of elk remain in the area through the fall hunting season, taking advantage of a security area north of Negro Mountain (in the closed road system) and of thickly forested, vehicle-restricted areas around Treasure Mountain to the south. Some of these elk may not descend to winter range until well into December. Elk summer habitat effectiveness and fall security have been primary concerns in managing this road system at least since the mid 1980s.

More recently, water quality, sedimentation, and fish habitat have emerged as key issues. People have been driving up into the Negro Mountain area for decades to hunt, camp, picnic, view wildlife, look for minerals, and tour the country. Until recently, a through-route was available from the Little Blackfoot to the Telegraph Creek side via Forest roads #4100 and #1857-B1 (the Moose Gulch road). Both roads have had problems with steady erosion on steep slopes. In 2004, a landowner built a house on an inholding astride the Moose Gulch road near the top of the gulch, barring motorized access from that direction. Some vehicles continue to drive up the lower portion of the road, but the route is blocked at about the 1.3 mile mark. The only other potential access route from the east side—road #1857-A1—is part of the restricted road system north of Negro Mountain and is closed yearlong to allow for elk security and habitat effectiveness. Other problems include (1) pioneering of new routes by OHVs; (2) vehicles fording Ontario Creek and, sometimes, the Little Blackfoot River to access road #4100 on the west side; and (3) some ineffective, and confusing, road restrictions toward the south that, among other things, allow vehicles (via road #1857-D1) into a closed road system in upper Telegraph Creek.

Alternative 1, No Action

Alternative 1 would preserve the arrangement described above—retaining 12.0 miles of open road, with a local open road density of about 1.7 mi/mi². Of these roads, 5.6 miles are closed during spring break-up (April 15—June 1) and the remainder are open yearlong.

The Moose Gulch road (#1857-B1), would continue to generate erosion problems, but the route now dead-ends at the private inholding atop the gulch, and, as a result, far fewer vehicles make use of it than when it was a through-route. Currently, there is no access all the way to Negro Mountain ridge from Telegraph Creek. The continued yearlong closure on road #1857-A1 and the network of old timber sale roads to which it connects would maintain a pocket of fall elk security and summer habitat integrity in the area north of Negro Mountain. Primary problems remaining would be illegal vehicle use of closed routes,

including continued subversion of the upper Telegraph Creek road closures from roads #1857-D1 and #1857-D2; continued pioneering of new motor bike/ATV/4wd routes; and lack of legal motorized access to the Negro Mountain ridge from Telegraph Creek; and the need for vehicles to ford Ontario Creek in order to get to Road #4100 on the west side of the ridge. A groomed snowmobile route crosses the area from the Little Blackfoot road to upper Telegraph Creek and is available for snowmobiling from December 1 to October 15 whenever snow depths allow (generally early December through late March).

Alternative 2

Under Alternative 2, 16.2 miles of road would be open to vehicles: 12.1 miles would be open yearlong and 4.1 miles (road # 1857-A1) from mid-May to mid-October—resulting in a total open road density of roughly 2.2 mi/mi². This is higher than the existing condition. No motor trails would be be open under this alternative.

Alternative 2 would close the eroding Moose Gulch Road (#1857-B1) between its junction with the Telegraph Creek road and the private inholding on the Negro Mountain ridge. The landowner has blocked public access at the crest of the ridge so that the road no longer provides vehicle access to Negro Mountain. To compensate for access lost by this restriction, 3.5 currently-closed miles of road #1857-A1 (3.5 miles) would be opened to vehicles from May 15 to October 15. This would retain local elk security for the big game rifle season and habitat integrity during early spring migration, but it would add a degree of motorized disturbance from late spring through early fall, reducing local elk habitat effectiveness.

In essence, the proposal would close a stream-side route with severe erosion and water quality problems (#1857-B1) in exchange for opening a dry, upland route (#1857-A1) with negative implications for big game—albeit with a mid-fall to mid-spring closure. On balance, retention of fall security is more important to elk and deer in this area than maintaining a local disturbance-free corridor in summer. But, the opening of road #1857-A1 would redistribute vehicle use in the Negro Mountain area. It would be responsible for most of the increase in open road mileage in this alternative *vs.* the existing condition (Alternative 1).

Under Alternative 2, road #4100, which ascends the ridge from the west, would eventually provide legal vehicle access from that direction, but not until a bridge is constructed over the Little Blackfoot River at the lower end of the road (which would be a future project separate from the current proposal). In the meantime, the road technically would be open to vehicles, but for all practical purposes, would not provide viable access from the Little Blackfoot side.

Most other existing road closures would be retained, with the notable exception of roads #1857-D1 and #1857-D2, which connect Negro Mountain roads with the currently-closed upper Telegraph road system. This officially-closed, though often driven, road would become a legally open route year-round (as would the upper Telegraph system to which it connects)—creating an extensive new loop driving/ riding opportunity and lowering big game security and habitat effectiveness in that area.

The groomed snowmobile route that traverses the area would be available essentially as it is now (with the opening date shifting from December 1 to December 2).

Alternative 3

Alternative 3, which in most areas emphasizes non-motorized access, would, in this case, provide only marginally less open road than the existing condition (11.8 miles *vs.* 12.0 miles at present). Like Alternative 2, this option would eliminate vehicle access to Negro Mountain on the lower Moose Gulch road (#1857-B1) and substitute road #1857-A1 as the open route from Telegraph Creek (with an October 15—May 15 closure). But, unlike Alternative 2, Alternative 3 proposes retaining the yearlong wheeled vehicle closure on road #1857-D1, which would block vehicle access from the upper Telegraph Creek road network to the south. Unlike Alternatives 1 and 2, Alternative 3 would also close road #4100, the only

viable access route to Negro Mountain from the Little Blackfoot River side—leaving road #1857-A1 as the only driving route to the ridge (and between October 15 and May 15 that route also would be closed as well, excluding wheeled vehicles from the area entirely). There would be no open motor trails under Alternative 3.

In terms of wildlife cost/benefit, Alternative 3 is slightly less conducive to big game habitat integrity than the existing condition (given potential effects generated by open route #1857-A1), but more beneficial than Alternative 2 (because of the closure on roads #1857-D1 and #1857-D2).

As in Alternative 2, the local groomed snowmobile route would be open from December 2 to May 15, as snow conditions allow.

Alternative 4

Alternative 4 is a hybrid proposal somewhere between Alternatives 2 and 3. Like Alternative 2 (and Alternative 1), it would allow the #4100 road system coming up from the Little Blackfoot side to remain open; but like Alternative 3 (and Alternative 1), it would retain the closure on roads #1857-D1 and #1857-D2 connecting to the upper Telegraph system to the south. As with other action alternatives, road #1857-A1, currently closed for elk security and habitat effectiveness, would be opened from May 15 to October 15 to compensate for the closure of of the Moose Gulch road (#1857-B1) and thus provide access from the lower Telegraph Creek side. As in Alternative 2, road #4100 from the west would be technically open to vehicles but would not provide viable access from that direction until a new bridge was constructed over the Little Blackfoot River sometime in the future. Alternative 4 would support 14.5 miles of open road and no motor trails. Open route density would be 2.0 mi/mi².

As with Alternatives 2 and 3, the opening of road #1857-A1 would erode summer habitat effectiveness for elk in the area north of Negro Mountain—although the rough condition of the upper half of the route is likely to limit casual use by many highway vehicles.

Conclusions

<u>Alternative 1</u> would preserve the status quo: Open road density would remain at 1.7 mi/mi² most of the year, access to the Negro Mountain ridge would be blocked from lower Telegraph Creek (by the private inholding above Moose Gulch), and road systems to the north and south would remain off-limits to vehicles so as to promote big game security and habitat effectiveness.

Under <u>Alternative 2</u>, local open road density would increase to 2.2 mi/mi² in summer. Vehicle access from lower Telegraph Creek would be provided via a currently-closed road (#1857-A1) to the northeast—allowing a loop riding opportunity between the Little Blackfoot and Telegraph Creek roads. The route would be closed in hunting season to maintain elk security, but summer habitat effectiveness would decline. Currently-closed routes into upper Telegraph Creek to the south (roads #1857-D2, #1857-D2) would be opened year-round, further lowering local elk security and habitat effectiveness.

<u>Alternative 3</u> would maintain open summer road density of 1.6 mi/mi²—similar to Alternative 1 but through a different combination of open and closed roads. As in Alternative 2, the currently-closed route to Telegraph Creek (#1857-A1) would be open between May 15 and October 15. But, unlike Alternative 2, it would maintain the road closures into upper Telegraph Creek to the south (#1857-D2), preserving elk security and habitat effectiveness in that area, and it would also close the main access road from the Little Blackfoot side (#4100).

<u>Alternative 4</u> , like Alternative 3, would open road #1857-A1 northeast of Negro Mountain for wheeled vehicle access from lower Telegraph Creek from mid spring to mid fall and it would maintain the yearlong closure on roads #1857-D1 and #1857-D2 into upper Telegraph Creek to the south. But unlike Alternative 3, it would allow continued wheeled vehicle access from the Little Blackfoot drainage via road #4100. Open road density in summer would be 2.0 mi/mi².

Upper Telegraph Creek

Area Characteristics and Wildlife Issues

This area, immediately west of upper Telegraph Creek, lies between two other key areas: Negro Mountain to the northwest and Ontario/Bison Creek to the southwest. Roads in the eastern half of the area traverse extensive cutting units from the first Treasure Mountain timber sale (1960s). These units are now clogged with large sapling lodgepole pine that provide good hiding cover. Most roads in this area are open to motor vehicles year-round. Roads in the western half of the area pass through a number of more recent clearcuts from the Ontario Creek timber sale (late 1980s). In order to compensate for loss of cover, these roads were closed as part of the elk security/habitat effectiveness plan associated with the timber sale. The road restrictions remain intact, although they are often subverted by vehicles that manage to circumvent barriers—often via road #1857-D1 coming down from the Negro Mountain area to the north.

In addition to serving as big game habitat in summer and fall, the upper Telegraph area supports grizzly bears, lynx, wolverines, and, sometimes, wolves—all in very low numbers. The non-motorized block between open roads in Telegraph Creek (#1859, #1859-B1, #495-D1) and Ontario Creek (#123) is not quite large enough to provide a bonafide elk security area [>250 acres, >0.5 mi from open road], but there is enough rugged, forested country in the vicinity to allow a number of elk to elude hunters in the fall. In addition, a variety of drainage-head habitats across the upper Telegraph Creek watershed provide a fertile summer environment.

Currently the upper Telegraph region supports 7.7 miles of open Forest system roads and 0.5 mile of user-made motor trail. Open route density is 1.4 mi/mi². About 8 miles of system roads are closed to wheeled vehicles, as are several miles of non-system roads (most of them old mining roads). Primary groomed snowmobile routes follow roads #495, #1859, and #1857-D1.

Alternative 1, No Action

Alternative 1 would maintain the existing condition described above: Basically, most roads in the east half of the area would remain open to vehicles yearlong and those in the west half would remain closed yearlong. Eventually, improved signing and road barriers should allow effective enforcement of vehicle restrictions—although these measures are beyond the scope of this planning effort. Local open route density would remain at 1.4 mi/mi². Snowmobile routes would be available whenever sufficient snow is present between December 1 and October 15. In this area, snow cover sufficient for snowmobiles may last into April.

Alternative 2

Alternative 2 would substantially expand the open road network by sanctioning wheeled vehicle traffic on now-closed roads associated with the Ontario Creek timber sale in the west half of the area. This includes roads #1859-D4, #1859-E1, and the west half of road #1859, as well as road #1857-D1, which connects with the Negro Mountain road network to the north. Open roads would total 13.0 miles (about 5.4 miles more than at present), producing a local open road density of about 2.2 mi/mi². The user-made motor trail would be eliminated. Snowmobile routes would be open December 2—May 15.

The increase in open roads would lower effectiveness of local habitats in the vicinity of Treasure Mountain for big game animals, as well as for other species wary of motorized activity. It would also erode local habitat security opportunity for elk during the hunting season, most likely displacing animals that currently make use of the area into vehicle-restricted refuges to the south and west.

Alternative 3

Alternative 3 is somewhat similar to the existing condition (Alternative 1) with regard to wheeled vehicles, maintaining considerably lower road density than Alernative 2. Roads open to wheeled vehicles would

total 6.7 miles (a bit less than at present), resulting in a local open road density of 1.2 mi/mi² (compared to 1.3 mi/mi² under Alternative 1 and 2.2 mi/mi² under Alternative 2). All open roads would be available to wheeled vehicles year-round, whenever snow conditions allowed. Aside from the elimination of a couple short spur road segments and a user-made motor trail, it is identical to Alternative 1—with similar implications for wildlife. Both Alternatives 1 and 3 are more favorable to local wildlife in terms of motorized disturbance and hunter access than is Alternative 2. Snowmobile season would be the same as Alternative 2: December 2—May 15.

Alternative 4

Alternative 4 is similar to Alternatives 1 and 3. It would maintain 7.5 miles of open road (yearlong) and no motor trails. Resulting local open route density would be 1.3 mi/mi². In general, most roads in the eastern part of the area would be open to wheeled vehicles year-round, those in the western reaches closed year-round. There would be no open road connection to the Negro Mountain area to the north other than by the indirect route along road #495, which follows the main stem of Telegraph Creek. As with Alternatives 1 and 3, elk security and habitat effectiveness would be good—although improvements in road closure mechanisms and signing would be required to make vehicle use patterns operate as intended.

Snowmobile use would be the same as in the other three alternatives.

Conclusions

Alternative 1 would maintain local open route density of 1.4 mi/mi²—mostly from open roads in the eastern half of the area. Until effectively blocked, illegal use of restricted roads coming in from the Negro Mountain area to the north (esp. #1857-D1) would continue to subvert road closures designed to provide for big game security and habitat effectiveness following timber sales in the 1970s and 1980s.

Under Alternative 2, local open route density would increase substantially to 2.2 mi/mi²—a result of opening 5.4 miles of currently-closed roads in the western half of the area to yearlong vehicle use. This would diminish local fall elk security and summer habitat effectiveness—an effect that would most likely be expressed via displacement of elk to other areas.

The open road system under Alternative 3 would be similar to the existing condition in its primary configuration, with local open route density declining to 1.2 mi/mi²—mostly from the closure of short segments of fringe and connector routes. Integrity of current road closures in the western half of the area would be dependent on better signing and physical barriers to reduce illegal motorized use (though such actions are not part of the current proposal).

Alternative 4 is similar to Alternatives 1 and 3 in terms of its road closures and its benefits for local wildlife habitat effectiveness and security. Local open route density would be 1.29 mi/mi². As with other alternatives, all wheeled vehicle closures would be yearlong. Snowmobile routes would be as in the other three alternatives.

Upper Ontario Creek – Bison Creek

Area Characteristics and Wildlife Issues

This area lies immediately south of the upper Telegraph Creek region and takes in the upper reaches of Ontario Creek, including the productive Bison Creek drainage. To the west and south, it abuts country that is either unroaded (esp. the Electric Peak Roadless Area) or in which roads are restricted for wheeled vehicles year-round. An extensive road network (>12 miles) in the western half of the area, constructed for the Bison Mountain Timber sale in the 1970s, accounts for most of the closed road mileage.

Wheeled vehicles are currently limited to the periphery of the area (road #495 in Telegraph Creek and road #4104 along Monarch Creek) and to a single Forest road (#495-D1) that comes in from the east and

follows the upper reaches of Ontario Creek, fording one of its tributaries in the process. This route is often deeply rutted and eroded. It remains on the east side of Ontario Creek, but ATV and motor bike riders have pioneered a track across the creek so as to hook into closed road #4104-A2, the CDNST, and the restricted Bison Mountain road system. Open road density in the area is low at 0.5 mi/mi² (generated by 4.1 miles of road open all year).

This area within the curve of the Continental Divide northeast of Bison Mountain encompasses the headwaters of Bison Creek, Ontario Creek, and parts of Monarch and Telegraph Creeks. It supports a broad mosaic of early and late-seral forests interspersed with wet meadows, riparian shrub communities, and grassland. The structural diversity, combined with the presence of highly productive sites and relative isolation from regular motorized disturbance (and human activity in general), afford excellent summer habitat opportunites for elk, deer, moose, black bears, grizzly bears and a variety of other wildlife species that thrive under such conditions. As with many areas dominated by mature lodgepole pine, forests in these drainages have been under attack by mountain pine beetle over the past few years, and standing dead trees have proliferated. Whitebark pine stands have been heavily impacted as well.

Alternative 1, No Action

This option would maintain the current situation described above. Motorized access to Ontario Creek via road #495-D1, especially the northward extension of the road along the creek, would continue to depress the habitat potential of local riparian areas for more than a mile. Its direct effect on the area-wide wildlife environment, however, would probably be marginal, given the extensive non-motorized country to the south and west. Indirectly, its impact would be more far-reaching because of the illegal access it wouold provide ATVs and trail bikes, once they cross the creek, to the old Bison Mountain road prisms and to the Continental Divide Trail (CDNST). Alternative 1 would maintain 4.1 miles of legally open road—2.1 miles on road #495-D1 and 2.0 miles on the peripheral roads in Monarch and Telegraph Creeks. Open road density would thus remain at 0.5 mi/mi². There would be no legally open motor trails.

In winter, a groomed snowmobile route (open after November 30) follows road #4104 in Monarch Creek and crosses the area via roads #1404-A1 and #495-D1, connecting to road #495 in Telegraph Creek. There is no big game winter range or wolverine denning habitat within reach of the trail, and no wildlife problems are evident.

Alternative 2

The primary change proposed in Alternative 2 would be to convert 2.2 miles of currently-closed road #4104-A1 to motorized trail (to be open May 15 to October 15). The existing road prism would remain in place but motorized use would be limited to trail bikes and ATVs. The short user-made route across Ontario Creek would be sanctioned for motorized use to allow connection with road #495-D1, thus completing a legal loop route across to Telegraph Creek. The dead-end extension of road #495-D1 northward along the riparian zone beyond this connection would remain.

The creation of a motorized through-route across the area is more a problem for wildlife than is the dead-end road that comes in from the east at present. This arrangement would lead to an increased flow of motor bikes and ATVs through the area because of the opportunity for a loop ride. When motorized use is persistent (most often on weekends) undisturbed habitat would be fragmented into north and south segments—an effect likely to redistribute elk use in the area, most likely toward the south. The same would be true for other uncommon, road-wary species such as black bears, grizzly bears, wolverine, lynx, mountain lions, and so on. The snowmobile route through the area would be open December 2—May 15.

Alternative 3

With regard to wheeled vehicles, Alternative 3 is identical to Alternative 1 (the existing condition) retaining road #495-D1 into upper Ontario Creek, including the northward dead-end extention along the

riparian zone, and maintaining the closure on road #4104-A1. Opening date of the snowmobile route would be changed from December 1 to December 2.

Alternative 4

Alternative 4 is identical to Alternative 2—converting closed-road #4104-A1along upper Ontario Creek to a motor trail open May 15 to October 15. All other currently closed roads would remain closed. The current snowmobile route would remain in place, with a one-day shift in the opening date. Implications for wildlife are the same as in Alternative 2.

Conclusions

Alternative 1 would retain local open road density at 0.5 mi/mi² in spring, summer, and fall. Most of the extensive road system in upper Ontario and Bison Creeks, built for past timber sales, would remain gated. It is likely that some illegal motorized use would continue to occur on this road system. But, in general, big game hunting season security and summer habitat effectiveness would remain high. There would be no legal motorized trails in this alternative.

Alternative 2 would retain local open road density of at 0.5 mi/mi², but it would open up a currently closed road along upper Ontario Creek as an ATV/bike trail in summer. This route would bisect the area between upper Telegraph and Monarch Creeks—substantially elevating wildlife disturbance through these alpine basins in summer. The route would be closed to vehicles during the big game rifle season, retaining high fall elk security.

Alternative 3 is essentially the same as Alternative 1, retaining the existing condition.

Alternative 4 is identical to Alternative 2, with the same implications for wildlife.

Hahn Creek – Flume Gulch – Mike Renig Gulch

Area Characteristics and Wildlife Issues

This area lies between northern Telegraph Creek (just above its confluence with the Little Blackfoot River) and the Continental Divide to the east. All motorized access is via the Hahn Creek road (#1856), which winds its way eastward up the Hahn Creek drainage from the Telegraph Creek road (#495), eventually passing through the headwaters basins of Flume Gulch, Little Flume Gulch, and Mike Renig Gulch just below the Divide.

The road is gated at the 3.7 mile mark near the top of Flume Gulch, and motorized use is restricted beyond this point yearlong. A second gate is located at the northern end of the road system in Mike Renig Gulch to block vehicles from that direction (although public access to the Forest boundary is severely limited by private holdings in that area). There are three exceptions to the vehicle restrictions: (1) Forest Service vehicles are allowed in for occasional resource management activities (fire suppression, silvicultural operations, road maintenance, weed control, etc.); (2) snowmobiles are permitted on the main road (#1856) and on a short CDNST connection to the Divide from December 1 until the snow base deteriorates; and (3) three private landowners, who have built part-time residences on an inholding in upper Mike Renig Gulch 2.5 – 3.5 miles behind the gate, are allowed to drive in between April 1 and November 30 (each has a key to a private lock on the gate). One of the landowners has been accessing the inholding for over 20 years; the other two more recently. In winter, the road is not plowed but they can access their properties via snowmobile if they wish.

Most landowner intrusion is localized along the main road (#1856) and around the cabins in the bottom of Mike Renig Gulch (although there are occasional reports of incursions into other areas). While this use does not appear to be displacing wildlife in any meaningful way, it has aggravated a number of recreationists, particularly hunters, some of whom would also like to be able to drive into the gated area and others of whom feel that the disturbance generated by the landowners impairs their walk-in hunting

opportunity. Hikers on the section of the CDNST that follows the road are also occasionally surprised by vehicles in the restricted area.

The 4 drainages in this area were extensively logged in the early 1980s—mostly by clearcutting. Forest system roads supporting these projects (along with a few routes previously in place) total over 21 miles. Open roads account for 11.2 miles (producing a local open road density of 1.2 mi/mi²). The gates on Road #1856 were installed in the early 1980s as wildlife mitigation. They were designed initially to buffer big game animals on spring/summer/fall ranges from excessive human interference, thus enhancing both security and habitat effectiveness. Since then, it has become evident that a number of other prominent species also benefit from the closure—lynx, wolverines, black bears, mountain lions, and beaver among them.

The upper Flume and Little Flume Gulch basins immediately behind the gate support numerous seeps and springs; and because of poor drainage, the water spreads out into a mosaic of riparian areas, wet meadows, and bogs. Beaver activity, which has waxed and waned over the years, has created ponds in the basin, further enhancing habitat opportunities for wildlife. Likewise, the headwaters of Mike Renig Gulch, while more confined, provide highly productive summer habitat. Overall, these upper drainages support roughly a 50/50 mix of mature and early-successional forest—although Mike Renig Gulch holds more mature forest and Little Flume Gulch more young regenerating forest. A majority of the old cutting units are now dominated by large sapling conifers, which in most cases provide good hiding cover for big game animals. This is excellent summer habitat for moose, elk, and deer, as well as black bears, mountain lions, lynx, and a wide variety of smaller mammals and birds.

Over the last 5 years, much of the mature forest—wherever lodgepole pine is present—has become infested with mountain pine beetle and is now dead or dying. This insect outbreak is in the process of dramatically altering the forest environment throughout the local drainages (and the Divide landscape in general), transforming much of the mature interior forest to open canopied early seral habitat clogged with snags and large woody debris.

Some elk remain in the vicinity of the closed road system during the hunting season, although most retreat to more rugged, densely forested country further back from the gate (along and over the Divide and around Jericho Mountain). Many hunters park at the gate and walk into the basins and up to the Divide during the course of the big game bow season (starting September 1) and rifle season (mid October – late November), as long as snow conditions on the Hahn Creek road allow. Elk, deer, and most moose abandon the upper drainages as snow accumulates in late fall or early winter.

In the last few years, lynx, wolverines, wolves, coyotes, bobcats, foxes, marten, and mountain lions have all been tracked through the upper drainages in winter (Wild Things Unlimited tracking surveys, 2006-2011). The snowmobile route through the center of the area does not appear to be displacing these animals. Snowmobile use levels are low, the activity is limited to daytime hours and concentrated on weekends, and virtually all riding is confined to the narrow road prism. The route is available to snowmobiles anytime snow conditions are right, except during the big game rifle season. Most use occurs from mid December through mid March.

Alternative 1, No Action

Under Alternative 1, conditions in this key area would remain as described above. Road #1856 and its spurs would remain gated to wheeled vehicle use by the general public yearlong; snowmobiles would continue to use the road as an ungroomed trail to access other trails on the Divide; and the exceptions for the private landowners would remain in place. A diversity of wildlife would continue to use the productive basins as summer habitat (May—September); easy walking access for hunters would continue to displace elk to the far reaches of the upper drainages and to more secure adjacent areas in the fall; and

a number of uncommon carnivores would continue to frequent the area in winter (and presumably in other seasons as well).

Alternative 2

Alternative 2 proposes one substantial change from the existing condition: The gate on road #1856 would be opened from October 15 to December 1 to allow motorized hunter access for about 4 miles along the main road during the big game rifle season. Rationale for this arrangement are that (1) access for the general public, even for only a few weeks, will alleviate some of the sense of injustice generated by the exclusive access allowed the private landowners and (2) the area is more important to big game as productive summer habitat than it is as a hunting season refuge. Be that as it may, this would reduce the security value of certain local habitats in upper Flume, Little Flume, and Mike Renig Gulches, and it is likely that any elk that have used the area for fall refuge in the past would be displaced to more secure areas to the south and west. The new open route would not come close enough to the elk security area around Jericho Mountain to reduce the size of that refuge. The dates for use of the snowmobile route would change from the current December 1 – October 15 to December 2 – May 15.

Alternative 3

Except for a couple minor differences, Alternative 3 is essentially the same as Alternative 1—the existing condition. Open road density would be slightly lower due to the closure of the north end of 4wd road #1863 on the Continental Divide in the southeast corner of the area. Dates for snowmobiles would be as in Alternative 2 (December 2 – May 15). The area would continue to serve as prime summer wildlife habitat; human-wary carnivores would continue to make use of the area in winter; fall elk security in Little Flume and Mike Renig Gulches would remain intact, though somewhat marginal because of the proximity of open roads and easy walk-in access.

Alternative 4

Alternative 4 is identical to Alternative 3: The implications for wildlife of proceeding with this alternative are the same as for Alternative 3 and much the same as for Alternative 1.

Conclusions

<u>Alternative 1</u> would retain local open road density at 1.2 mi/mi² year-round. The two gates that block public wheeled-vehicle access to upper Little Flume and Mike Renig Gulches would remain intact, although local landowners would still be allowed access to their inholdings above the Hahn Creek gate. The main road would continue to serve as a snowmobile route in winter. Wildlife use of these productive drainage-dead basins would remain high.

Under <u>Alternative 2</u>, local open road density would remain at 1.2 mi/mi² for most of the year. But, the gate on the main road in Little Flume Gulch would be opened for the big game rifle season, allowing motorized access to four miles of currently closed road. It is likely that any elk in this area at the start of the rifle season would move to more secure sites in adjacent drainages.

<u>Alternatives 3 and 4</u> are identical. Under these alternatives, local open road density would decline slightly to 1.2 mi/mi². With a couple minor exceptions, Alternatives 3 and 4 are identical to Alternative 1 and would maintain the same level of wildlife habitat integrity in this key area.

Slate Creek – Elliston Creek

Area Characteristics and Wildlife Issues

This habitat block encompasses most of the Slate Creek drainage and the upper half of the Elliston Creek drainage. The central feature of the upper drainages is Slate Lake—a modest-sized body of water (of about 2 acres) at mid-high elevation (precisely 6,000 ft) surrounded by an extensive wet meadow complex. The headwaters of both drainages originate here, with Elliston Creek flowing northward and

Slate Creek eastward (both eventually ending up in the Little Blackfoot River). The upper Elliston Creek drainage accommodates a few primitive roads/trails, none of which are currently open to wheeled motor vehicles but which see a certain amount of illicit use. The upper drainage is part of an elk security area, the southeastern corner of which encompasses Slate Lake.

The Slate Creek drainage, on the other hand, was logged in the 1970s and 1980s—mostly by clearcutting—and retains a functional Forest road network created for those projects. Currently, the western half of the road system toward Slate Lake is closed to vehicle use yearlong, while the eastern half toward the Little Blackfoot River—with connections to the Elliston area toward the north—is open year-round. Open roads in the Slate Creek and upper Elliston Creek drainages cover 4.5 miles, resulting in an open road density of 0.7 mi/mi². Closed Forest roads account for 9.9 miles of the system. There is at least one unauthorized user-made motor trail in the Slate Lake area, the use of which requires ATV and motor bike riders to circumvent 2 closure gates.

A groomed snowmobile trail, available December 1 – October 15, follows roads #1871 and #1871-A1 through the Slate Creek drainage, connecting trails in the Elliston area (to the north) with those in the Treasure Mountain/ Telegraph Creek area (to the southeast). Both roads are open to wheeled vehicles year-round (although snow conditions discourage most winter use).

Riparian areas along the upper half of Slate Creek and the wet meadow/forest mosaic around Slate Lake provide excellent summer habitat for elk, deer, moose, black bears, and numerous other species attracted to productive, high-diversity habitats—including rare carnivores such as lynx, wolverines, and grizzly bears. The absence of motorized access and scarcity of human presence in general around Slate Lake makes this area particularly attractive to wildland species. In the fall, a substantial number of elk remain in the Slate Lake/Elliston Creek security area as long as possible, often through the entire hunting season if not forced out by snow accumulation. Dense mature forests in the area are currently being opened up by heavy bark beetle infestation, but the area should continue to provide security by virtue of its distance from open roads. A few hunters manage to drive into the area illegally via primitive tracks from the south and by circumventing gates on both the upper and lower Slate Creek roads (#1871 and #1871-A1).

Alternative 1, No Action

This alternative would maintain the existing condition. There would be no changes in motorized routes and restrictions under this alternative. The Elliston Creek/Slate Lake elk security area would remain more or less intact and summer habitat effectiveness in the Slate Lake area would remain relatively high.

Alternative 2

The principal innovation of Alternative 2 is the expansion of the open road/trail system into the western half of the area. The proposal would open up 3.4 miles of currently-closed Forest system road and user-made trail in the Slate Lake area to provide a legal riding opportunity for ATVs and motor bikes in an area they now use clandestinely. The new open route would make use of roads #1871 and #1871-A1 behind the two closure gates in upper Slate Creek and a non-system track that connects the two roads through the Slate Lake meadows. The entire route would be designated a “motorized trail”, available from May 15 to October 15, and *not* open to full-sized vehicles (wider than 50 inches). The on-ground tactics for developing the trail and enforcing compliance with the new rules would need to be worked out in a later decision (as the trail needs to be moved up out of the meadows and away from the lake, where part of it is submerged in wet years).

In addition to the new routes around Slate Lake, road #314-E1, which comes in to Elliston Creek from road #314 to the north and west and is now gated year-round, would be open to all vehicles throughout the year. As a result of these changes, open route density in the Slate Creek/ Elliston Creek area would rise from the current 0.7 mi/mi² to 1.6 mi/mi² between May 16 and October 14 and to 1.1 mi/mi² between October 15 and May 15.

Because the new Slate Lake trail would be closed to motorized use during the big game rifle season, it would not affect elk security during that period. However, it may serve to displace animals and consequently lower local hunter opportunity during the bow season (early September – mid October). Likewise, consistent presence of ATVs and trail bikes around Slate Lake after May 15 would measurably lower habitat effectiveness of that productive summer range. Currently, the user-made routes run through the margins of the Slate Lake meadows, sometimes churning up the wet habitat. More serious habitat damage, however, is generated by vehicles riding out through the center of the meadows creating multiple off-route tracks. The potential for this activity would increase as the level of motorized use expanded.

The current snowmobile trail would be available for use from December 2 to May 15.

Alternative 3

This alternative is identical to Alternative 1 (the existing condition) with respect to wheeled vehicles—and would have the same effect on the wildlife resource. The open road system would remain at 4.5 miles. The user-made at Slate Lake would not be sanctioned as a suitable motorized route. The Slate Lake/ Elliston Creek elk security area would remain intact and the habitat effectiveness of Slate Lake summer habitat would remain relatively high (assuming that road restrictions can be effectively enforced). The current snowmobile trail would be available for use from December 2 to May 15, as in Alternative 2.

Alternative 4

Alternative 4 is identical to Alternatives 1 and 3 in terms of the official status of the road and motor trail system. Wildlife security and habitat effectiveness would remain basically sound, although they would continue to be less than optimal with ongoing use of unauthorized motor routes in upper Elliston Creek and the Slate Lake area.

Conclusions

Under Alternative 1, local open road density would remain at 0.7 mi/mi² yearlong. While there are no designated motor trails, user-made routes behind the gates on the Slate Lake and Slate Creek roads would continue to pick up some illegal use in summer and fall, as would closed and unauthorized routes in upper Elliston Creek. In spite of this, the upper Slate Creek/ Elliston Creek area would remain a relatively secure, focal area for wildlife year-round—picking up use by grizzly bears, black bears, mountain lions, elk, deer, and moose in spring, summer, and fall and by lynx and wolverines year-round.

Under Alternative 2, local open route density would rise to 1.6 mi/mi² as a result of 3.4 miles of newly opened motor trail in the Slate Lake area (to be closed during the big game rifle season, winter, and early spring) and 3.0 miles of new yearlong open road in upper Elliston Creek. This increased activity would periodically displace elk and other animals wary of human activity from the Slate Lake meadows area in summer and potentially year-round in upper Elliston Creek.

Alternatives 3 and 4 are essentially identical to Alternative 1 and maintain the same level of habitat integrity in the productive habitat region around Slate Lake and in upper Slate and Elliston Creeks.

Lower Sweeny Creek – Blue Cloud

Area Characteristics and Wildlife Issues

The Sweeny Creek road/trail system covers about 2,000 acres of often rough, bouldery terrain on the north side of lower Sweeny Creek about 7 miles west of Helena. A little of the system laps over into the Blue Cloud Creek drainage to the northeast as well. Because of its proximity to Helena and U.S. Highway 12, it receives a considerable amount of recreational use, both motorized and non-motorized. HNF system roads are limited to a couple 4wd tracks that total about 1.6 miles. The remaining 11.7 miles consist of ATV/motor bike routes that are also used by day-hikers, mountain bikers, and horseback riders. Most routes are user-created. While snowmobiles are currently allowed on the trail system, its low

elevation and overall south-facing aspect retards snow accumulation and, combined with the rugged terrain, wards off most snowmobilers. Virtually all local snowmobilers park at the lot further up Sweeny Creek and run up Forest road #335 to Priest Pass and primary snowmobiling areas along the Divide.

Much of the road/trail system runs through relatively dry mature ponderosa pine/Douglas-fir forest, but parts of it extend into primary big game winter range to the northwest. This extensive foraging area, created by a fire in the 1950s, now supports some of the most productive bitterbrush and aspen habitat on the Helena Ranger District. Mule deer and moose—and, to a lesser extent, elk—zero in on the area throughout the winter, sometimes using adjacent forest for cover. Goshawks also winter in the mature forest in lower Sweeny Creek.

Because of its proximity to subdivisions, major roads, and other human activity—as well as the density of motorized trails—the lower Sweeny Creek drainage does not provide big game security or long-term refuge for species wary of human presence. Its primary value is as winter range at a time of year when local human activity is minimal.

Alternative 1, No Action

Alternative 1 would preserve this status quo. Currently, there are no restrictions as to which of the user-made routes ATVs, trail bikes, and, sometimes, 4wd vehicles may use. There are over 12 miles of these tracks weaving through an area of about 4 mi^2, producing a motor trail/open road density of 3.5 mi/mi^2 — very high.

While white-tailed deer and mule deer may frequent the area throughout the spring, summer, and fall, the bulk of the big game use (elk, moose, and deer) occurs during the winter and early spring and is focused in the browse-rich burned habitat in the northwest part of the area. Most recreational use occurs in spring, summer, and fall and is confined to the road and trail system, which penetrates only the fringes of the winter browsing area. As a result, disturbance of big game animals is relatively light—most of it coming in early spring from antler hunters and wildlife watchers. Snowmobile use is a potential disruptive factor; but in most years, snow conditions are too marginal for all but a few users. In deep-snow winters, the winter range can pick up some limited use from snowmobilers who would normally launch toward the Divide from the nearby Sweeny Creek/Priest Pass road.

Alternative 2

This alternative would retain much of the current motorized use—establishing a system of designated trails slightly less extensive than the existing network. However, only vehicles less than 50 inches wide (ATVs and motor bikes) would be allowed on the trails, and all vehicles, including snowmobiles, would be prohibited from October 15 to May 15. Open route density from mid spring through mid fall would drop from 3.5 mi/mi^2 to 3.2 mi/mi^2—still quite high. This level of motorized activity would continue to discourage use by the more cautious wildlife species (elk, black bears, etc.) from late spring through early fall. But, the absence of all vehicle disturbance from mid fall through mid spring would enhance the value of the area as prime winter range. It may also improve hunting opportunity for hunters on foot.

Alternative 3

Alternative 3 would convert the current trail and road network to non motorized uses all year. The only open route would be a short segment of the the Sweeny Creek road on the southwest edge of the area. Resulting open route density would be 0.2 mi/mi^2. The snowmobile closure from Alternative 2 would apply here as well. Conversion to completely non-motorized activity would reduce the magnitude and intensity of disturbance to wildlife, although human presence—via hiking, mountain biking, horseback riding, hunting, cross-country skiing, and so on—would continue to weigh in. While lessened disturbance levels might make the area more attractive to some of the more wary species, it is unlikely that any would find long-term habitat security here. As in Alternative 2, potential for human disruption of key winter range functions would be much less than at present.

Alternative 4

Alternative 4 is identical to Alternative 3, eliminating all motorized use of trails and 4wd routes. Open route density would be 0.2 mi/mi² (all from the adjacent Sweeny Creek road). As with Alternative 3, the magnitude and intensity of human disturbance would decline substantially from current levels—benefiting both local wildlife and non-motorized recreation.

Conclusions

Alternative 1 would support a low open road density but would retain a maze of motor trails, totaling over 12 miles: Open route density would be 3.5 mi/mi² year-round. There would continue to be no seasonal restrictions: Snowmobiles could use the trails when snow was adequate (although this would remain an uncommon occurrence). The potential for motorized activity as a disruptive influence on prime big game winter/spring range in the northwestern end of the area and adjacent slopes beyond would remain in place.

Under Alternative 2, local open trail/road density would drop slightly to 3.2 mi/mi² with the closure of a few erosive and duplicative trail sections. Trails would be closed to all vehicles, including snowmobiles, from October 15 to May 15 to improve habitat effectiveness for big game and other species wary of motorized activity. Since this low-elevation area is important primarily as big game winter range, the winter and early spring restrictions would result in much less motorized disturbance to these animals than Alternative 1.

Under Alternative 3, open route density would drop dramatically to 0.2 mi/mi². All local trails would be reserved for non-motorized users yearlong. Big game use would probably not increase noticeably, as human presence (though non-motorized) would remain high. As in Alternative 2, the intensity of winter range disturbance would remain much lower than in Alternative 1.

Alternative 4 is identical to Alternative 3. Open route density would be 0.2 mi/mi²--a result of the proximity of the Sweeny Creek road. From a wildlife standpoint, it would represent a substantial improvement over the existing condition.

Priest Pass

Area Characteristics and Wildlife Issues

This area—about halfway between MacDonald and Mullan Passes on the Continental Divide—encompasses a network of roads and trails that converges on Priest Pass and the adjacent area immediately to the east. The only primary Forest route in the area is road #335, which comes through Priest Pass on an east-west trajectory and is a well-used connector between Sweeny Creek on the east side of the Divide and Dog Creek on the west side. Most remaining roads in the area, though carrying Forest system road numbers, are primitive and rough—some of them difficult even for 4wd vehicles. The exception is the modest #355-A1/A2 road network about 2 miles east of the pass, created for the Porcupine timber sale in the 1970s and still in decent condition, in large measure because it is gated to public motorized use yearlong.

The Helena Snowmobile Trail map (HNF, MFWP, BLM 2003) shows no groomed or marked trails in the Priest Pass area; but in winter, snowmobilers park at a site in lower Sweeny Creek and ride HNF roads through the pass in order to connect to the groomed trails at Mullan Pass to the north. The current travel plan allows snowmobile travel on all open roads in the area.

Priest Pass is a local center of wildlife activity. As a low point on the Continental Divide at the origins of two drainages, it is a natural crossing point. The drainage-head basins on either side provide productive habitat—both forested and non-forested. The pass lies at the interface of extensive mature forest and grassland communities. In addition, the broad ridge just south of the pass supports old-growth forest overlaying and interspersed with a variety of wet sites—an environment that is attractive to many species.

MFWP seasonal range maps (2004, 2010) show Priest Pass within the margins of east-side elk winter range. This, however, appears to be an artifact of using April and May elk locations to help delineate "winter" use. In fact, the area is summer range for elk, mule deer, and moose: They arrive with spring green-up, typically in May, and remain in the high country, often through the hunting season, until driven out by snow. Grizzly bears, wolves, lynx, and wolverines have all been identified along this part of the Divide in recent years.

Alternative 1, No Action

This option preserves the existing condition, as outlined above. Roads #355-A1 and #355-A2 would remain gated to vehicles (for wildlife habitat effectiveness and security). The user-made route (#U-205) that heads north nearly opposite this gated system would continue to be used as such, as would road #1846, which diverges northeast from Priest Pass. Also remaining open to motorized use would be "road" #1802-B2, which follows the Continental Divide National Scenic Trail (CDNST) route south of the pass. This route is especially steep and eroded, but it would continue to be negotiated by an assortment of ATVs, motor bikes, and 4wd vehicles. This would remain a problem both for big game security during the hunting season and habitat integrity in summer. The CDNST north of the pass would remain closed to wheeled motor vehicles (although it would probably continue to pick up a little illegal use). Local open routes would total 8.9 miles under Alternative 1, producing an open route density of 1.3 mi/mi^2.

Alternative 2

Alternative 2 would eliminate some motorized routes but would open up a currently-restricted area to motor vehicles during the hunting season. The 2 primitive motorized tracks coming through Priest Pass on the CDNST would be closed to vehicles yearlong, as would the user-created route heading northward off the Priest Pass road about 2 miles east of the pass (#U-205). These restrictions would enhance local big game security and habitat effectiveness. On the other hand, Alternative 2 would open currently-gated roads #335-A1 and #335-A2 to motorized use during the big game rifle season (October 15—December 1). While this would provide hunters easy access to new country, it is unlikely to have a real impact on elk security. This area is close to a major Forest road and is heavily worked by hunters on foot. The influx of vehicles on the newly opened roads is likely to quickly displace any elk that might be present.

In the end, Alternative 2 would maintain 7.7 miles of road open to vehicles at some time of the year. Local open road density would be 1.1 mi/mi^2 during the hunting season (slightly less than at present) and 0.7 mi/mi^2 the rest of the year. Snowmobile use would be eliminated on route #1805-E1/#U-205, but otherwise would remain the same.

Alternative 3

Alternative 3 would implement all of the new closures proposed in Alternative 2 (routes #1802-B2, #335-B2, #U-205) but, like Alternative 1, it would retain the yearlong closure for roads #335-A1 and #335-A2—resulting in 4.9 miles of local roads open throughout the year. Year-round open route density would be 0.7 mi/mi^2 (the same as Alternative 2 outside the hunting season). Snowmobile use would be the same as in Alternative 2.

Alternative 4

Alternative 4 is identical to Alternative 3 and would have the same implications for wildlife. The elimination of 3.8 miles of strategically located primitive roads/trails and retention of the hunting season closure on roads #335-A1, A2 would substantially lower the potential for motorized disturbance of wildlife.

Conclusions

Under <u>Alternative 1</u>, local open road/motor trail density would remain at 1.3 mi/mi^2. The CDNST south of Priest Pass would remain open as a primitive 4wd road. Illegal use of closed routes and user-created trails

is likely to continue for the time being, complicating wildlife use of this focal habitat area in spring, summer, and fall.

Under Alternative 2, local open route density would decline to 1.1 mi/mi² in all but the big game rifle season. No motor trails would be retained. 4wd roads along the CDNST would be closed to all vehicle use. These restrictions would improve local habitat effectiveness of the Priest Pass area in spring, summer, and early fall. A short road system two miles east of the pass, currently gated year-round, would be opened to vehicles during the big game rifle season. This is not an area frequented by elk in mid-late fall, and the change is unlikely to have much effect on big game security.

Alternatives 3 and 4 are identical. They would establish all of the road and trail closures proposed in Alternative 2 but would also retain the year-round closure on the two miles of gated road east of the pass. These measures would improve both habitat effectiveness and fall security for big game and a variety of other species that move through and linger in the Priest Pass area. Like Alternative 2, these alternatives would remove motorized use from the CDNST.

Black Mountain – Meyers Hill – Ophir Creek

Area Characteristics and Wildlife Issues

This area lies at the northwestern tip of the Divide landscape, just south of the Nevada Mountain Roadless area on the Lincoln Ranger District and the Little Prickly Pear area closure on the Helena District (established in 1999). Most of the area around Black Mountain itself is unroaded, and most (though not all) of the roads in the southern half of the area in the Ophir Creek drainage are closed to wheeled motorized use year-round (although snowmobiles make use of the gated road systems in winter). Forest road #136—the primary (though often difficult) connecting route across the Divide in this area—runs along the southern border of the area.

Primary motorized access into the area is via primitive "road" #136-D1, a historic route that ascends the southeast ridge of Black Mountain from Forest road #136. At its lower end, the first 0.5 mile of the old road—from its junction with road #136 to a worn kellihump and impromtu parking lot at the edge of the timber—is a designated road for highway vehicles. The next two miles are designated for ATVs and motor bikes. The route once provided vehicle access to the broad forested summit of Black Mountain, but now, the 4wd track ends about 0.4 mile below the summit at a point where the CDNST, which has followed the old road to this point, diverges around the slope to the northeast.

Some time after 1999, however, motor bike and ATV users cut out and blazed a trail that follows the old route to the top of Black Mountain. From this point, they pioneered a new route down the southwest slope and out through unroaded country to private roads in Georgia Creek, with an alternate route into the closed Forest road system in the North Fork of Ophir Creek. This illegal route—although not shown on the alternative maps—totals 5.0 miles and is regularly ridden, mostly by trail bikes. It is used almost entirely for recreational riding in summer and not as a motorized access/retrieval route for hunters in the fall. Most hunters park at the impromptu parking lot at the 0.5 mile mark of road #136-D1 and hike up the old road (although the road is technically open to vehicles during the rifle season).

The largely unroaded country around Black Mountain is a *de facto* extension of the roadless area to the northwest and the motorized area closure to the northeast. It is heavily forested, for the most part, and provides spring, summer and fall habitat for elk, deer, and moose. It is also occupied by back bears, grizzly bears, lynx, wolverine, fishers, bobcats, mountain lions, and numerous other species, rare and abundant. In particular, the broad benchland southwest of Black Moutnain provides complex, productive habitat and a secure movement corridor. It supports lodgepole pine/subalpine fir/whitebark pine/Engelmann spruce old-growth forest as well as a number of productive wet sites. The area provides refuge for hunted species in the fall (much of it falling within an extensive elk security area). The user-made motor trail,

however, threatens to subvert summer habitat integrity throughout the area, and it holds the potential to undermine big game security if it begins to pick up motorized use during the hunting season.

Alternative 1, No Action

This alternative would preserve the existing condition. Route #136-D1 would remain open to highway vehicles for its first 0.5 mile and to ATVs and motor bikes for the next two miles. The primary problem with this arrangement is that the dead-end trail allows recreational riders to get well up into the high country but then, does not provide them with a loop route. As a result, there is a real incentive for some riders to continue along the illegal user-made route over the top of Black Mountain and out through unroaded country to connecting routes in Ophir Creek and Georgia Creek. Effective closure of this route has been complicated by its remoteness, which makes enforcement difficult. This would continue to be the case. With the trail in regular use, open route density would remain at 1.1 mi/mi².

Current snowmobile use patterns would remain in place—with "allowed" use on all open roads and "sanctioned" use on most gated roads. The long-standing "play area" on the ridge between Ophir and Georgia Creeks (Airplane Park) would remain—as no conflicts with big game, lynx, wolverines, denning bears, or other wildlife have been noted.

Alternative 2

Alternative 2 would retain the first 0.5 mile of the Black Mountain road (#136-D1) as a yearlong motor route. An existing parking site at the edge of the timber at the 0.5 mark would serve as a trailhead for the Black Mountain segment of the CDNST. The remainder of the route would be closed to all motorized use year-round. With an effective closure on the road at the bottom of the slope, the likelihood of recreational riders attempting the clandestine loop route over Black Mountain would be substantially reduced. Likewise, monitoring and enforcement of the closure would be much simpler. This would improve habitat effectiveness of the key wildlife zone atop and southwest of Black Mountain. Density of routes available to wheeled vehicles would drop from the current 1.1 mi/mi² to 0.4 mi/mi²—most of the route mileage stemming from border road #136 and some dead-end roads in Ophir Creek.

The first 2 miles of Road #136-D1 would be open to snowmobiles, up to the start of the user-made trail. The trail beyond there is steep, narrow, and winding—often in dense timber—and is generally unattractive to snowmobiles. Other snowmobile use patterns would remain as they are now, although usage of the gated road systems in Ophir Creek would be clarified by specifically designating these routes as snowmobile trails, rather than allowing them to be used without that designation as at present.

Alternative 3

Like Alternative 2, Alternative 3 would cut off motorized use of road #136-D1 after 0.5 mile, allowing the remainder of the route to serve as a non-motorized segment of the CDNST and reducing potential for ATVs and motor bikes to exploit the trail as an illegal loop route through wildland wildlife habitat. The only difference between these two scenarios is that Alternative 3 would close a user-made motor trail that runs around the north side of Meyers Hill, connecting to road #136 at both ends. The closure would not be enough, however, to drop open route density below 0.4 mi/mi².

Alternative 4

Alternative 4 is identical to Alternative 2. It would close 2 miles of the Black Mountain road and close down the user-made Black Mountain-Ophir trail. It would leave open the 0.6 mile user-made trail at Meyers Hill. As in Alternative 2, open route density for wheeled vehicles would be 0.4 mi/mi² year-round. Snowmobile use patterns and trail designations would be the same as in Alternative 2.

Conclusions

Under Alternative 1, local open route density would remain at 1.2 mi/mi². The Black Mountain road would remain open to all vehicles for 2.5 miles. There would be no legally open motor trails, but the

user-made trail off the end of the Black Mountain road would remain accessible to motor bikers. This trail disrupts a key habitat enclave and linkage area for wildlife south of Black Mountain—including elk, deer, black bears, grizzly bears, mountain lions, wolverines, and lynx—and allows motorized access into the closed road system behind the gate in North Fork Ophir Creek.

Under Alternative 2, local open route density for wheeled vehicles would decline to 0.4 mi/mi². Closure of the Black Mountain road at the 0.5 mile mark would make access to the illegal motor trail at its upper end difficult and enforcement of the closure much easier to accomplish. The result would be improved effectiveness of the key wildlife refugium and linkage zone south of Black Mountain and of the North Fork Ophir Creek road closure.

Alternative 3 is the same as Alternative 2 with the exception of the closure of a user-made route on the north side of Myers Hill. Open route density for wheeled vehicles would be 0.4 mi/mi².

Alternative 4 is identical to Alternative 2 and would provide the same benefits to wildlife that result from more effective closure of the Black Mountain user-made trail. Retention of the short user-made motor trail at Meyers Hill would be of little consequence to wildlife, primarily because of its proximity to main road #136.

SENSITIVE PLANTS

Regulatory Framework

The Endangered Species Act (1973) as amended, the National Forest Management Act of 1976 (PL 94-588) and the National Environmental Policy Act (1978) require protection and consideration of threatened, endangered, and other "rare" species.

Threatened and endangered plant species in Region 1 include:

- Macfarlane's four-o'clock (*Mirabilis macfarlanei*)
- Spalding's catchfly (*Silene spaldingii*)
- Water howellia (Howellia aquatilis)
- Western prairie fringed orchid (*Platanthera praeclara*)

There are no known or suspected populations of these species on the HNF. These species will not be discussed further in this report.

The *Forest Plan* for the Helena National Forest (USDA 1986) direction for sensitive plants (II/20) is as follows:

8. Species of Special Concern

There are habitats on the Forest where the following species of special concern may be found:

Lemhi penstemon (Penstemon lemhiensis)

Howell's gumweed (Grindelia howellia)

Missoula phlox (Phlox missoulensis)

Cliff toothwort (Cardamine rupicola)

Missoula phlox and cliff toothwort have been located on the Helena Forest. Other plants that are termed rare have also been located on the Helena Forest. They are Klaus' bladderpod (Lesquerella klausii) and

Long-styled thistle (Cirsium longistylum). Two additional rare plants, Moschatel (Adoxa moschalellina) and lesser rushy mikvetch (Astragalus connvallarius) are believed to occur on the Helena Forest but currently have no occurrence records.

If any of these species are verified on the Helena Forest, appropriate measures, pursuant to Section 7 of the Endanger(ed) Species Act, will be taken.

The Forest Plan refers to Section 7 of the Endangered Species Act. Section 7(a)(1) states that "All other Federal agencies shall…utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species…." Section 7(a)(2) states that "Each Federal agency shall, in consultation with the U.S. Fish and Wildlife Service, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened or result in the destruction or adverse modification of (its) habitat" (Reel et al. 1989).

Subsequent to the completion of the Forest Plan, the Regional Forester has designated sensitive plant species for the Region, and identified the known and suspected species for each Forest. Regional office direction in 2011 updated the Forest's sensitive species list. That list still includes two of the species listed in the Forest Plan, Howell's gumweed, and Missoula phlox (now called Phlox kelseyi var. missoulensis instead of P. missoulensis). The other species that are listed in the Forest Plan are not included in the updated sensitive plants list for the Forest or the Northern Region and are not included in specific species searches. The 2011 list reflects a change made in November of 2004, in which the Regional Forester removed long-styled thistle (Cirsium longistylum) from the sensitive plant list. The Regional Sensitive Species list can be found in the project file.

A letter from the Regional Foresters of Regions 1, 4, and 6, dated August 7, 1995 (found in the project file), further defines the Forest Plan intent with the following: "Loss of individuals or habitat can be considered significant when the potential effect may be: 1. Contributing to a trend toward Federal listing; 2. Results in a significantly increased risk of loss of viability to a species; or, 3. Results in a significantly increased risk of loss of viability to a significant population (stock)."

Assumptions

The following assumptions were used:

- No ground disturbing activities are proposed in this project.
- Use of over-snow motorized vehicles would not result in any plant disturbance as the ground would be covered with snow.
- Roads and motorized trails located on private land and those that are not under Forest Service management were not considered in this analysis.

Design Features

A 100 foot buffer would be established around any known populations where no herbicide application would occur. The exception for this would be *Juncus hallii*, which is not affected by broadleaf herbicides; non-specific herbicides such as Round-up would not be allowed for application within a 100 foot buffer of *Juncus hallii* populations.

If any sensitive plant populations are found within road rights of way, those areas would be buffered and protected using the same design criteria as the known habitat. A buffer would be established around each plant population as a no-entry zone for equipment associated with road maintenance.

Wetlands, seeps and springs would be protected from ground disturbance in the design criteria for this project.

Monitoring

Continual survey work in potential habitat would occur associated with other projects that would add to the knowledge base for sensitive plant populations and habitat. This information would be used to protect new populations as described above.

Information Used

The HNF sensitive species list and descriptions for the HNF were used for this analysis.

Experience, GIS analysis and information from plant surveys in adjacent areas and specific plant surveys in high potential habitat were used to determine areas that would be more likely to support sensitive plant populations.

The Montana Natural Heritage Program (MTNHP) maintains a statewide database for sensitive species. Data from the MTNHP were used for known sensitive plant populations. Ground reconnaissance was conducted by the HNF ecologist and trained field crews in representative habitats within the Divide travel planning area. Reconnaissance of representative habitats is appropriate to determine the presence of sensitive plant populations.

Geospatial systems combined with habitat information, on the ground experience, and past surveys are useful to screen areas of low probability of species occurrence.

Forest Inventory Analysis (FIA) plot protocol requires identification of sensitive plant species; these data were analyzed for sensitive plant presence. Botanists were part of data collection crews in the FIA data collection, and were instructed to look for sensitive plants while travelling between plots as well as while collecting data at plots. Known habitats need to be specifically identified and surveyed in the field.

New plant populations have been found and are included in the Forest GIS layer as well as the analysis.

Past surveys by the MTNHP (Barton and Crispin 2002; Poole and Heidel 1993) as well as past surveys by the HNF ecologist were used to focus the survey work.

Surveys conducted in conjunction with other projects were used to supplement the knowledge base for the Divide travel planning area. Potential habitat was identified by selecting landtypes that commonly have high or perched water tables, along with slopes of 0–10% to locate treatment areas that may support habitat for the species that require moist habitats. Potential wetlands were surveyed by trained field crews who also searched for sensitive plant species.

A University of Montana Master's study (Nock, 2008) was conducted within the Divide travel planning area that identified potential habitat which was then surveyed for sensitive plants.

Both negative and positive survey information was used from all surveys in preparing this analysis.

Methodology & Scientific Accuracy *(40 CFR 1502.15)*

The methodology used in this analysis includes best available data from several geospatial layers using known sensitive plant populations to predict sensitive plant habitat.

General reconnaissance surveys as well as FIA data collection were conducted in the Divide travel planning area. Botanists were part of the FIA data collection crews and were instructed to search for sensitive plants while travelling between data points as well as at the data points themselves. The specific layers used to identify potential sensitive plant populations include the MTNHP data on sensitive species, the HNF Soil Survey (USDA 2001), habitat types from the Master Vegetation database, experience from past surveys, and field crew surveys in areas identified as potential habitat.

Numerous surveys and inventories have been conducted in the Divide travel planning area over the past 20 years or more: FIA grid intensification plots are a systematic placement of intensive inventory plots where data collectors are instructed to search for and identify sensitive plant species (see project file for detailed information on FIA data collection procedures); roadside surveys associated with noxious weed infestations (Barton and Crispin, 2002), project level reconnaissance by Forest Service field crews); riparian study plots; field survey crew inventories (Little Blackfoot Allotments, North Divide Allotments). Negative survey information is used in identifying potential habitat, and as well as to help identify areas that do not support sensitive plant habitat. A list of past projects in the Divide travel planning area can be found in the cumulative effects table (Appendix B).

A literature review has been completed of available information on sensitive plant species, habitat and disturbance process effects on flora (Barton and Crispin 2002; Chadde et al. 1998; Cooper et al. 2005; Hurd et al. 1994; Mack et al. 2000; Montana Natural Heritage Program, Plant Species of Concern Database (MTNHP 2010); Nock 2008; Pauchard et al. 2003; Reel et al. 1989)

Sensitive Plants, Affected Environment

Introduction

This report will serve as the biological evaluation for the project.

Sensitive species in the Northern Region of the Forest Service are those plant and animal species identified by the Regional Forester for which population viability is a concern. Viability concern is evidenced by (1) substantial current or predicted downward trends in population numbers or density and/or (2) substantial current or predicted downward trends in habitat capability that would reduce a species' existing distribution (Reel et al. 1989).

The HNF has known or suspected occurrences of twenty *species* of sensitive plants. A complete list of these species and a description of associated habitat can be found in the table below. The likelihood of occurrence of a given species within the planning area and status is also listed below. There are no known or suspected populations of *threatened* or *endangered* species of plants on the Helena National Forest (HNF).

The HNF has known or suspected occurrences of twenty species of sensitive plants.

The species listed as "possible" are those species whose habitat is potentially included in the planning area. The remaining species do not have habitat that would be directly impacted by these activities, due to the type of habitat or geographic location in which the plants occur.

The species that are specifically addressed in this assessment are those identified as possible in the planning area (indicated in bold in the following table).

Table 3.80 HNF Sensitive Plant Species

Species	Known Occurrences HNF	Known from Divide Travel Plan Area	Likelihood of Occurrence in Planning Area
Amerorchis rotundifolia Orchidaceae	No	No	Unlikely – known from the Rocky Mtn. Front and NW corner of state, in spruce forests along seeps/streams. Geographically unlikely to occur.
Aquilegia brevistyla Ranunculaceae	No	No	Unlikely – in Montana, known only from Little Belt Mtns.; open woods and stream banks at mid-elevations in montane zone. Geographically unlikely to occur.
Astragalus lackschewitzii Fabaceae	No	No	Unlikely – restricted to high elevation gravelly and rocky slopes and ridges; habitats not generally subject to human disturbance.
Botrychium crenulatum Ophioglossaceae	No	No	**Possible** – known from the Beaverhead Deerlodge and in western Montana, generally in wet habitats with high cover
Botrychium paradoxum Ophioglossaceae	Yes	Yes	**Known** from the Occidental Plateau, and near Irish Mine Hill; habitat of Helena NF populations are in sagebrush/rough fescue and rough fescue,.however other populations have been documented from mesic meadows associated with spruce and lodgepole pine forests in montane and subalpine (MTNHP 2010),
Cypripedium parviflorum Orchidaceae	No*	No	**Possible**. Habitat in fens, damp mossy woods, seepage area, and moist forest-meadow ecotone, valley & lower montane. Former location near Mount Helena has not been relocated and is believed to be in error (Mincemoyer email, project file).
Cypripedium passerinum Orchidaceae	No	No	Unlikely– in mossy, moist, or seepy places in coniferous forest; northwestern Montana including Glacier NP. Geographically unlikely to occur.
Drosera anglica Droseraceae	Yes	No	Unlikely – Known from Indian Meadows, occurs with sphagnum moss in wet, organic soils of fens. Specialized habitat not present in Divide travel plan area.
Drosera linearis	Yes	No	Unlikely – Known from Indian Meadows, in

Species	Known Occurrences HNF	Known from Divide Travel Plan Area	Likelihood of Occurrence in Planning Area
Droseraceae			wet,organic soil of nutrient-poor fens. Specialized habitat not present in Divide travel plan area.
Epipactis gigantea Orchidaceae	No	No	Unlikely – associated with seeps/springs, often thermal. Specialized habitat not present in Divide travel plan area.
Goodyera repens Orchidaceae	No	No	Unlikely – in Montana, known from Little Belt and Big Snowy Mtns.; in moist, montane forests with mossy understory. Geographically unlikely to occur.
Grindelia howellii Asteraceae	No	No	Unlikely – endemic known only from a cluster of sites in the Blackfoot drainage wetlands, and a single county in Idaho. Geographically unlikely to occur.
Juncus hallii Juncaceae	Yes	Yes	**Known**—several populations occur on the Forest in the Big Belts and the Divide area. Moist to wet meadows.
Oxytropis podocarpa Fabaceae	No	No	Unlkely – habitat in alpine zone. Specialized habitat not present in Divide travel plan area.
Phlox kelseyi var. missoulensis Polemoniaceae	Yes	Yes	**Known** from the Divide Travel plan area, including the analysis area; habitat is rough fescue meadow, exposed, limestone-derived slopes in foothills and montane.
Polygonum douglasii ssp. austinae Polygonaceae	Yes	No	Unlikely – Known only from the Big Belts landscape in open gravelly shale-derived soil of eroding slopes/banks or usually moist barren shale slopes, Geographically unlikely to occur.
Saxifraga tempestiva Saxifragaceae	No	No	Unlikely– Montana endemic known only from vernally moist open sites and rock ledges at high elevations, west of Continental Divide. Geographically unlikely to occur.
Schoenoplectus subterminalis Cyperaceae	Yes	No	**Possible**– Known from Indian Meadows, and sites in NW primarily west of Continental Divide; open water and boggy margins of ponds, lakes, and sloughs.

Species	Known Occurrences HNF	Known from Divide Travel Plan Area	Likelihood of Occurrence in Planning Area
Thalictrum alpinum Ranunculaceae	No	No	Unlikely – in Montana, known from sites in SW corner, in moist alkaline meadows. Geographically unlikely to occur.
Veratrum californicum Liliaceae	No	No	Unlikely – in Montana, from 4 sites in Bitterroot Valley. Geographically unlikely to occur.

*** Species found on or very near the HNF. Bolded—Species whose habitat is potentially included in the planning area.**

Analysis Area

The rights of way of travelways within the Divide travel planning area was used as the analysis area for direct effects; the Divide travel planning area was used for indirect effects on individual populations.

Sensitive Plant Populations

This assessment addresses the potential for sensitive plant populations to occur in the planning area and within the rights of way of travelways, and the effects of the alternatives on those populations.

Species Known or Possibly Present

All species on the sensitive list are searched for in any sensitive plant surveys. Numerous past vegetation data collection efforts by Forest personnel and MTNHP staff have failed to discover any sensitive plant populations in the planning area. Forest Inventory Analysis Intensified Grid data collection that occurred on a grid across the entire Divide travel plan area in 2007 and 2008 did not identify any sensitive plant populations.

Three sensitive plant species known to have habitat in the planning area include: *Botrychium paradoxum, Juncus hallii* and *Phlox kelseyi* var. *missoulensis*. Additionally the following three species may have habitat in the planning area: *Botrychium crenulatum, Cypripedium parviflorum* and *Schoenoplectus subterminalis.*

Botrychium crenulatum has not been found to-date on the Helena Forest. This species has been found on the Beaverhead-Deerlodge Forest, immediately adjacent to the Helena National Forest in the Occidental Plateau area. The habitat for this species is moist to wet areas, similar habitat to that of *Juncus hallii*. This species is searched for in all wetland and riparian surveys but has not been found on the Helena Forest to date. This species was not found to-date in field surveys of the area nor in FIA grid intensification which included the planning area.

Botrychium paradoxum is known from two populations on the Helena National Forest, one in the Divide travel planning area. The habitat for this species on the Helena National Forest is open grassland and open grassland/sagebrush. The population in the planning area is near a motorized trail in the Irish Mine Hill area, in an open rough fescue grassland area. The population is adjacent to the junction of existing travelways as shown in the comparison table in the conclusions section.

Table 3.81 Roads or Trails with Known Populations of *Botrychium paradoxum*

Trail	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Trail 501*	Open to vehicles 50" or less, no seasonal restrictions	Motorized trail open 5/16-10/14	Closed year-round to wheeled vehicles	Closed year-round to wheeled vehicles
Road 314	Open to motorized vehicles 6/1-8/3. Open to over snow 12/1-8/31	Open Highway legal 5/16-10/14. Open to over snow 12/2-5/15	Open Highway legal 5/16-10/14. Open to over snow 12/2-5/15	Over snow only

Cypripedium parviflorum has not been found to date on the Forest. An unverified record of this species from the Mount Helena area has been determined to be unfounded. Habitat for this species includes fens, moist woods and seepage areas in the lower mountain areas. Limited habitat exists in the planning area due to the low elevation that this species occupies, along with the moist habitat requirements.

Juncus hallii has eleven populations occur in the analysis area. Of those eleven, four populations of this species are known from within or very close to road rights of way within the Divide travel planning area. The populations are associated with the headwaters of Ontario and Clemmer gulches, in Sure Thing swamps, one location in the headwaters of Tenmile Creek and a population near Chessman reservoir. This species typically occurs in moist grasslands and sedge meadows (Poole and Heidel 1993). The Helena populations are on the edge of more moist riparian or wetland areas, similar to the habitat for *Botrychium crenulatum*. Many negative surveys were found during wetland identifications. The populations tend to be small and isolated; it is likely that many populations could exist, particularly in the area where other known populations are concentrated. The species has not been found to date west of the Little Blackfoot River, or north of Highway 12 in the planning area.

Table 3.82 Roads or Trails with Known Populations of *Juncus hallii*

Road	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Road 1859-B1	Open Highway legal	No Change	No Change	No Change
Road 1859-E1	Closed year-round	Open Highway legal	Over snow vehicles only	Over snow vehicles only
Road 1859-E2	Open Highway legal	Open Highway legal	Over snow vehicles only	Over snow vehicles only
Road 1863	Open Highway legal	Over snow vehicles only	Over snow vehicles only	Over snow vehicles only

Phlox kelseyi var. missoulensis has seven known populations within the analysis area. Two large populations, north and south of the highway on MacDonald pass, one population in the Austin Creek area, one small population on Trail 501 (Kading cabin); one east of Larabee Gulch road (no road nearby); one

between the top of Kading Grade (Tr 501) and the Fred Burr road, 1868; and one on either side of Road 708-E3 (Snowshoe ck). Several of the populations are near motorized travelways. The MacDonald Pass site is adjacent to noxious weeds. The other populations do not currently have noxious weeds immediately adjacent to the populations. This species could occur in other areas of rough fescue grasslands in the planning area. Numerous negative survey information is available in the project file.

Table 3.83 Roads or Trails with Known Populations of *Phlox kelseyi var. missoulensis*

Road/Trail	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Rd 337, CDNST	No change	No change	No change	No change
Rd 1017-A1	Open to motorized vehicles 5/16-4/14. Over snow no restrictions	Open to highway legal year-round. Over snow 12/2-5/15	Open to highway legal year-round. Over snow 12/2-5/15	Open to highway legal year-round. Over snow 12/2-5/15
Rd 1802-C1	Open highway legal 5/16-21/1. Open to over snow 5/16-21/1	Open highway legal 5/16-21/1. Open to over snow 12/2-5/15	Closed to motorized vehicles year-round	Open highway legal 5/16-21/1. Open to over snow 12/2-5/15
Rd 708-E3	Open highway legal no seasonal restrictions	Open highway legal no seasonal restrictions	Open highway legal no seasonal restrictions	Open highway legal no seasonal restrictions
Trail 501*	Open to vehicles 50” or less, no seasonal restrictions	Motorized trail open 5/16-10/14	Closed year-round to wheeled vehicles	Closed year-round to wheeled vehicles
East of Rd 495	Open highway legal no seasonal restrictions	No change	No change	No change
East of Burr Ck road-Rd 1868	Open to wheeled motorized vehicles, 6/1-8/3; over snow 12/1-8/31	MT 5/16-10/14	Over snow only 12/2-5/15	Over snow only 12/2-5/15
Tr 502	Open to vehicles 50” or less, no seasonal	Motorized trail 5/16-10/14	Closed to motorized vehicles year-round	Closed to motorized vehicles year-round

Road/Trail	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	restrictions			
Tr 503	Open to vehicles 50" or less, no seasonal restrictions	Motorized trail 5/16-10/14	Closed to motorized vehicles year-round	Closed to motorized vehicles year-round

*this trail also accesses a population of *Botychium paradoxum*

Schoenoplectus subterminalis is known only from the Indian Meadows RNA in the northern portion of the Forest in true fens. This species is associated with wetland habitats and fens which are limited on the Forest. This species was not found to-date in field surveys of potential wetlands in the area nor in FIA grid intensification which included the planning area.

Species Unlikely To Be Present

Astragalus lackschewitzii, Drosera anglica*, Drosera linearis*, Epipactis gigantean, Oxytropis podocarpa, and Veratrum californicum all have specialized habitat that does not occur in the analysis area. These species will not be included in the effects analysis as the specialized habitats are not known to occur.

Amerorchis rotundifolia, Aquilegia brevistyla, Cypripedium passerinum, Goodyera repens, Grindelia howellii, Polygonum douglasia var. austinae* Saxifraga tempestiva, and Thalictrum alpinum are unlikely to occur due to geographic separation from known habitats. These species have not been found on the Helena Forest to date, but the species are always searched for in any survey work. Habitat for these species potentially to exists in the analysis area.

These species will not be analyzed further.

Sensitive Plants, Environmental Consequences

Effects Common to All Alternatives

A direct effect of motorized travel would be the constant exposure of weed seeds to the rights of way of motorized travelways, specifically those areas with a sensitive plant population. Noxious weeds can outcompete most native plants for nutrients, water and sunlight. The spread of noxious weeds has a very adverse potential impact on sensitive plant populations forest-wide (Mack, 2000; Pauchard et al 2003). If these species are left unchecked is it likely that noxious weeds would occupy sensitive plant populations, especially those close to motorized routes in drier habitats. The HNF requires weed-seed-free feed for stock users; this limits the exposure of noxious weeds seeds on non-motorized areas. Bicycles can carry weed seeds, but is much less likely to carry weed seed or plant parts any distance. Animals (both domestic and wild) can carry noxious weed seeds in their coats (Campbell and Gibson, 2001; Myers et al. 2004). An indirect effect of weed infestations in the rights of ways would be that the entire planning area would be exposed to weed introduction and transfer by motorized vehicles (Trunkle and Fay, 2001) and to a lesser extent, bicycles and other non-motorized travel. The increased weed presence would pose a threat to sensitive plants and their habitat throughout the travel planning area.

In addition to spreading weeds, vehicles that travel off established routes have the potential to directly harm sensitive plant populations by driving in or near the populations.

The presence of humans in the forest increases the risk of man-caused wildfire, which would be an indirect impact. The potential exists for wildfire to have a short term detrimental effect on sensitive plant habitats, but no long-term effects in most cases. However there has been a dramatic increase of severe wildfires in the ponderosa pine type in recent decades where fuels have built up due to fire suppression (Agee and Skinner 2005), In these habitats there is potential for long-term damage to sensitive plant habitats (Menges and Dolan 1998; Pendergrass et al. 1999). Plant response to fire is a result of the interaction between severity of the fire and the individual plant species' inherent resistance to injury and ability to recover (Brown et al. 2000). Mortality of herbaceous species is more dependent on the length of time plants are exposed to high heat, determined by the amount of duff and woody fuel consumed by the fire, than flame length and fire line intensity (Armour et al. 1984). The effect of wildfire on sensitive plant habitats therefore would depend on the surface fuel conditions. The longer fuels build up on the forest floor, the greater the potential damage to sensitive plant habitats.

Wildland fires also risk enhancing nonnative plant invasions if severe fires damage the native vegetation. Canada thistle, bull thistle, knapweeds, Dalmation toadflax and cheatgrass have been shown to increase following wildfire (Harrod and Reichard 2002). Noxious weeds are a serious threat to sensitive plant habitats. Wildland fires can also exacerbate nonnative plant invasions if native vegetation is damaged by severe fire. Studies in interior ponderosa pine forests have shown that Canada thistle, bull thistle, knapweeds, Dalmation toadflax, and cheatgrass increase after fire (Jacobs and Sheley 2003; Keeley 2006).

The spread of noxious weeds can have an adverse impact on sensitive plant populations whether or not a fire occurs. Noxious weeds dominate plant communities and tend to form monocultures which negatively impact native biological diversity. This weed competition to individual plants and plant communities can result in loss of species diversity and sensitive native plants. If noxious weeds are left unchecked, they can out-compete sensitive plant populations, especially those close to motorized routes in drier habitats. Herbicide application would have variable effects on sensitive plant populations. Broadleaf herbicides (eg. 2,4D or Tordon) could adversely impact *Botrychium crenulatum* and *B. paradoxum*; *Cypripedium parviflorum* and *Phlox kelseyi* var. *missoulensis* would be adversely affected by broadleaf herbicides with the exception of herbicides that are specificically designed to harm plant families, such Asteraceae, the aster family. Grasslike species, *Juncus hallii* and *Schoenoplectus subterminalis*, would not be harmed by herbicides designed to kill broadleaf plants. These species would, however, be harmed by herbicides that are "non-specific" and kill both broadleaf and grasslike species. An example of this type of herbicide is Round-up. The *Helena National Forest Weed Treatment Project FEIS* provides guidance for proper weed treatment (USDA 2006) and provides guidance for appropriate herbicides to be used. Herbicide application used to control noxious weeds would adversely affect sensitive plant populations as described above unless sensitive plant populations were protected from herbicide application.

Irreversible/Irretrievable Commitments

There are no irreversible/irretrievable commitments that would affect sensitive plants under any of the alternatives as known populations would be protected from ground disturbance associated with road maintenance or the use of herbicides.

Cumulative Effects

The cumulative effects area is the Helena National Forest as effects on plant populations throughout the Forest are considered in determining potential impacts to the overall population.

Cumulative effects from the list of projects noted in the cumulative effects table in Appendix B of the DEIS would be minimal. The projects that have occurred since 1993 have all had ground reconnaissance to determine whether sensitive plant populations would be impacted by those actions. No sensitive plant populations have been found in areas that would be impacted. Where sensitive plant populations were

found, such as the Cave Gulch Fire Salvage project, populations were buffered from treatment. The treatment in that case was herbicide use. No adverse impacts were predicted to occur from the actions associated with the projects listed in the cumulative effects table. The actions associated with the projects listed in the cumulative effects Appendix may have impacted individuals or habitat but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Present/ongoing projects that have been considered in this analysis include; livestock grazing, Clancy Unionville Vegetation Management Project, and the Roadside Hazardous Tree Removal Project and South Belts Travel implementation.

- Several livestock grazing allotments have known plant populations within the allotment boundary. The livestock grazing that occurs in the Big Buffalo allotment, Hat Creek allotment, Clancy allotment, Dry Creek allotment and the MacDonald Pass unit of the Tenmile allotment has been ongoing for many decades. The plant populations known from these areas (Phlox kelseyi var. missoulensis, Polygonum douglasii ssp. austinae, Juncus hallii and Botrychium paradoxum) are still present and have not shown adverse effects from grazing.
- Clancy-Unionville Vegetation Management Project: Implementation is ongoing. This project includes temporary road construction and timber harvest. A sensitive plant population (Botrichium paradoxum) is known from the planning area but was not affected by treatment units.
- Roadside Hazard Vegetation Treatment: This project would treat approximately 9614 acres with mechanical tree removal. Field surveys were completed on the treatment areas in 2009. Three populations of Juncus hallii were found in proposed units. Those populations would be protected from ground disturbing activities and herbicide application.

For the reasonably foreseeable future, the following projects have been reviewed; Telegraph Vegetation Project, Grassy Mountain Vegetation Project, Stonewall Vegetation Management Project, Blackfoot Summer Travel Plan, Blackfoot Winter Travel Plan, Warm Springs Habitat Enhancement Project, Hogum Wildlife Habitat Project, and Alice Creek Wildlife Habitat Project.

- Cabin Gulch Vegetation Project: This project would treat approximately 3315 acres with a combination of timber harvest and prescribed fire. Up to 9.1 miles of new temporary road would be built. There are no known populations of any sensitive plant species in the planning area. If any populations should be discovered, those populations would be protected from ground disturbing activities and buffered from herbicide application as appropriate.
- Telegraph Vegetation Project. This project would treat approximately 6300 acres with a combination of pre-commercial thinning, timber harvest and prescribed fire. Up to 6 miles of new temporary road would be built. There are known populations of Juncus hallii in this planning area. Those populations have been identified and would be protected from ground disturbing activities and herbicide application.
- Grassy Mountain Vegetation Project. This project would treat approximately 3900 acres with a combination of prescribed fire and timber harvest. Up to 0.5 miles of new temporary road would be built. Intensive vegetation data collection in the planning area was completed in 2006. No sensitive plant populations were found during those surveys or previous surveys. If any populations are found at any time they will be protected from ground disturbance or herbicide application.
- Stonewall Vegetation Management Project: This project would treat approximately 8500 acres with a combination of pre-commercial thinning, timber harvest and prescribed fire. Up to 5 miles of new temporary road would be built. Field surveys of the proposed units and temporary roads were completed in 2009. No sensitive plant populations were found during those surveys or

previous surveys. If any populations are found at any time they would be protected from ground disturbance or herbicide application.

- Blackfoot Summer Travel Plan: This decision would be to determine what roads would be open to motorized traffic. The decision would also include prescriptions for closing routes which would include ground disturbance. There are known sensitive plant populations of Drosera anglica, Drosera linearis, Phlox kelseyi var. missoulensis and Schoenoplectus subterminalis within the planning area that could potentially be affected. These populations have been identified in the sensitive plant analysis and would be protected from ground disturbing activities and herbicide application. Design criteria and continuing monitoring would protect any sensitive plant populations found
- Blackfoot Winter Travel Plan: This decision would be to determine what roads would be open to motorized traffic in the winter season. The decision would have minimal ground disturbance; no new routes would established and no existing routes would be closed. There are known sensitive plant populations within the planning area of Phlox kelseyi var. missoulensis. Design criteria and continuing monitoring would protect any sensitive plant populations found.
- Hogum Wildlife Habitat Project: this decision would include using prescribed fire to enhance wildlife habitat on 1500 acres on the Lincoln ranger district. There are no known sensitive plant populations in the area. Design criteria and continuing monitoring would protect any sensitive plant populations found.
- Alice Creek Wildlife Habitat Project: this decision would include using prescribed fire to enhance wildlife habitat on 1500 acres on the Lincoln ranger district. There are no known sensitive plant populations in the area. Plant surveys are planned in the summer of 2011. Design criteria and continuing monitoring would protect any sensitive plant populations found.

Surveys are currently occurring or have been completed for future foreseeable actions. If populations have been/are found, they will be protected from ground disturbance or herbicide application. For more information, please see Appendix B.

Effects Common to All Action Alternatives

The effects common to all alternatives would apply to all Action Alternatives.

Alternative 1, No Action

Direct and Indirect Effects

There are numerous travelways that have known sensitive plant populations. Alternative 1 has the highest amount of motorized travelways of all alternatives.

Botrychium paradoxum populations: Alternative 1 would have the most potential impact as both routes would be open to motorized traffic.

Juncus hallii populations: Alternative 1 closes 1859-E1 year-round, but leaves the other roads open. Overall this alternative has potential for adverse impacts to the populations, although road 1859-E1 is close to the populations, and closing this route would benefit the populations.

Phlox kelseyi var. *missoulensis* populations: Alternative 1 would have the most potential impact to *Phlox kelseyi* var. *missoulensis* by leaving all routes with populations open to wheeled motorized vehicles.

Alternative 2

Direct and Indirect Effects

Botrychium paradoxum populations: Alternative 2 would have the most potential impact (and the same as Alternative 1) as both routes would be open to motorized traffic.

Juncus hallii populations: Alternative 2 would limit road 1863 to over snow, but would leave the other roads open. This alternative potentially would have the most potential to impact the species, as the populations are closer to road 1859-E1 than to road 1863.

Phlox kelseyi var. *missoulensis* populations: Alternative 2 would have the most potential impact (the same as Alternative 1) to *Phlox kelseyi* var. *missoulensis* by leaving all routes open to wheeled motorized vehicles.

Alternative 2 would eliminate wheeled motorized use on approximately 22% of the travelways in the Divide travel planning area. This would be slightly more restrictive than Alternative 1, but substantially less restrictive than Alternatives 3 or 4. Motorized wheeled vehicles would have the potential to introduce noxious weed seed and spread noxious weeds at a higher rate than over snow vehicles or nonmotorized means of travel (Trunkle and Fay, 2001).

Alternative 3

Direct and Indirect Effects

Botrychium paradoxum populations: Alternative 3 would provide the most protection to this species by closing both motorized routes year-round. This is the only alternative that closes both routes.

Juncus hallii populations: Alternatives 3 and 4 provide the best protection for the plant populations, by limiting all of the roads except 1859-B1 to over snow, when minimal damage would be done.

Phlox kelseyi var. *missoulensis* populations: Alternative 3 would provide protection for known populations by closing four of the five routes motorized vehicles either totally, or allows only over snow vehicles.

Alternative 3 is the least impactive alternative, along with Alternative 4, by restricting the use of motorized vehicles more than Alternatives 1 or 2. Alternative 3 would be most beneficial to *Botrychium paradoxum* as compared to other alternatives. Alternative 3 would be slightly less beneficial to *Phlox kelseyi* var. *missoulensis* as compared to Alternative 4, but more beneficial than Alternatives 1 or 2.

Overall, Alternative 3 would restrict motorized use on approximately 31% of the travelways in the Divide travel planning area. This would be the most restrictive alternative and would provide the most longterm protection of sensitive plants by limiting potential exposure to noxious weed infestations.

Alternative 4

Direct and Indirect Effects

Botrychium paradoxum populations: Alternative 4 would provide some protection by closing one of the routes that affect this population to motorized wheeled vehicles year-round. Alternative 3 would provide more protection as both routes would be closed.

Juncus hallii populations: Alternatives 3 and 4 provide the best protection for the plant populations, by limiting all of the roads except 1859-B1 to over snow, when minimal damage would be done.

Phlox kelseyi var. *missoulensis* populations: Alternative 4 provides the best protection for this species as it would close all five open routes with populations.

The routes affecting known sensitive plant populations are shown under Alternative 1. Alternative 4 is the least impactive alternative along with Alternative 3 by restricting the use of motorized vehicles more than Alternatives 1 or 2. Alternative 4 is most beneficial to *Phlox kelseyi* var. *missoulensis* as compared to Alternative 3. Alternative 4 is slightly less beneficial to *Botrychium paradoxum* as compared to Alternative 3.

Overall, Alternative 4 would restrict motorized use on approximately 29% of the travelways in the Divide travel planning area. This would be slightly less restrictive then Alternative 3 but would provide better longterm protection of sensitive plants by limiting potential exposure to noxious weed infestations than Alternatives 1 or 2.

Conclusions

Under all alternatives, design criteria would be applied to protect populations from ground disturbance or herbicide application within a 100 foot buffer as appropriate for herbicides.

Alternative 1 would have the highest potential impact on sensitive plants by having the least restriction on motorized wheeled vehicles. Alternative 1 provides the least restriction on the use of motorized wheeled vehicles in the Divide travel planning area. This alternative would have the most potential direct impact on sensitive plant populations by leaving the above roads and trails open. This alternative would also have most potential for indirect impact on the populations with the highest potential for introduction and spread of noxious weed seed throughout the travel planning area.

Overall, Alternative 1 would eliminate wheeled motorized use on approximately 20% of the travelways in the Divide travel planning area, the lowest restriction of any alternative. This would be slightly less restrictive than Alternative 2 (22%), but substantially less restrictive than Alternatives 3 (31%) or 4 (29%) Motorized wheeled vehicles would have the potential to introduce noxious weed seed and spread noxious weeds at a higher rate than over snow vehicles or nonmotorized means of travel (rTrunkle and Fay, 2001).

Botrychium paradoxum populations: Alternative 1 would have the most potential impact (and the same as Alternative 2) as both routes would be open to motorized traffic.

Juncus hallii populations: Alternative 1 closes 1859-E1 year-round, but leaves the other roads open. Overall this Alternative has potential for adverse impacts to the populations, although road 1859-E1 is close to the populations, and closing this route would benefit the populations.

Phlox kelseyi var. *missoulensis* populations: Alternative 1 would have the most potential impact to *Phlox kelseyi* var. *missoulensis* by leaving all routes with populations open to wheeled motorized vehicles.

Alternative 2 would have more potential for adverse effects than Alternatives 3 or 4, but somewhat less impact than Alternative 1. With the design criteria and proposed mitigation, the action alternatives may impact individuals, but would not contribute toward a trend for federal listing or loss of viability.

Botrychium paradoxum populations: Alternative 2 would have the most potential impact (and the same as Alternative 1) as both routes would be open to motorized traffic.

Juncus hallii populations: Alternative 2 would limit road 1863 to over snow, but would leave the other roads open. This alternative potentially would have the most potential to impact the species, as the populations are closer to road 1859-E1 than to road 1863.

Phlox kelseyi var. *missoulensis* populations: Alternative 2 would have the most potential impact (the same as Alternative 1) to *Phlox kelseyi* var. *missoulensis* by leaving all routes open to wheeled motorized vehicles.

Alternative 2 would have a somewhat lower potential for indirect impact on the populations as compared to Alternative 1 with the high potential for introduction and spread of noxious weed seed throughout the travel planning area.

Alternative 3 would have a substantially lower potential for indirect impact on the populations as compared to Alternatives 1 or 2 with the lower potential for introduction and spread of noxious weed seed throughout the travel planning area because motorized vehicle use would be restricted.

Botrychium paradoxum populations: Alternative 3 would provide the most protection to this species by closing both motorized routes year-round. This is the only Alternative that closes both routes.

Juncus hallii populations: Alternatives 3 and 4 provide the best protection for the plant populations, by limiting all of the roads except 1859-B1 to over snow, when minimal damage would be done.

Phlox kelseyi var. *missoulensis* populations: Alternative 3 would provide protection for known populations by closing four of the five routes motorized vehicles either totally, or allows only over snow vehicles. Alternative 4 would close an additional route that is (road 1802-C1) that is near a large population, and would provide additional protection although there are open roads near the population.

Alternative 4 would have a substantially lower potential for indirect impact on the populations as compared to Alternatives 1 or 2 with the lower potential for introduction and spread of noxious weed seed throughout the travel planning area because motorized vehicle use would be restricted.

Botrychium paradoxum populations: Alternative 4 would provide some protection by closing one of the routes that affect this population to motorized wheeled vehicles year-round. Alternative 3 would provide more protection as both routes would be closed.

Juncus hallii populations: Alternatives 3 and 4 provide the best protection for the plant populations, by limiting all of the roads except 1859-B1 to over snow, when minimal damage would be done.

Phlox kelseyi var. *missoulensis* populations: Alternative 4 provides the best protection for this species as it would close all five open routes with populations.

Overall, Alternatives 3 and 4 would have the lowest level of potential to affect sensitive plant populations by restricting motorized wheeled vehicle use, with Alternative 4 being most beneficial to *Phlox kelseyi* var. *missoulensis*, and Alternative 3 more beneficial to *Botrychium paradoxum*.

In terms of indirect impacts, the potential is highest for the spread of noxious weeds under Alternative 1 with the least restrictions to wheeled motorized vehicles, with Alternative 2 slightly less impactive. Alternative 4 requires the most restrictions to motorized vehicles, with Alternative 3 slightly less restrictive. Both Alternatives 3 and 4 would be substantially more restrictive than Alternatives 1 and 2.

Overall, Alternative 3 would eliminate wheeled motorized use on approximately 31% of the travelways in the Divide travel planning area and would be the most restrictive alternative. Alternative 4 would be slightly less restrictive then Alternative 3 at 29%, but would provide better longterm protection of sensitive plants by limiting potential exposure to noxious weed infestations than Alternatives 1 or 2. Alternative 1 would eliminate wheeled motorized use on 20% of the travelways, while Alternative 2 would eliminate wheeled motorized use on approximately 22% of the travelways.

Forest Plan Consistency

Several sensitive plant populations have been found to date in the analysis area. The project is consistent with Regional direction, Forest Plan Standards and Guidelines and the Endangered Species Act. Surveys have been completed for past, present, and reasonably forseeable actions. If populations have been/are found, they will be protected from ground disturbance or herbicide application. As directed by the Forest Plan, if any of the species of special concern are verified, appropriate measures would be taken.

The previous design features would be incorporated for all the action alternatives. The design criteria would protect the populations from disturbance. The following determinations apply to all action alternatives.

SPECIES- Botrychium crenulatum

Direct, Indirect, and Cumulative Effects of Proposed Actions

This species is known from the Beaverhead-Deerlodge Forest, immediately adjacent to the Helena National Forest. This species is associated with wetland habitats. This species was not found to-date in field surveys of the area nor in FIA grid intensification which included the planning area.

Determination

The decision may impact individuals but would not contribute toward a trend for federal listing or loss of viability.

SPECIES- Botrychium paradoxum:

Direct, Indirect, and Cumulative Effects of Proposed Actions

Botrychium paradoxum is known from two populations on the Helena National Forest, one in the Divide travel planning area. The habitat for this species on the Helena National Forest is open grassland and open grassland/sagebrush. The population is adjacent to the junction of two existing travelways described earlier (Table 3.81).

Alternative 3 would provide the best protection for this population as no motorized vehicles would travel the routes during the growing season. Alternatives 1 and 2 would have the most potential impact as both routes would be open to motorized traffic. Alternative 4 would provide some protection by closing trail 501 year-round.

Determination

The decision may impact individuals but would not contribute toward a trend for federal listing or loss of viability. The existing routes have been in place for many years, and the population has not been impacted. As long as the routes do not change location, direct impacts to the population are unlikely. Indirect impacts due to noxious weeds would be more likely with Alternatives 1, 2 or 4. Alternative 3 would provide the best protection to this population.

SPECIES- Cypripedium parviflorum:

Direct, Indirect, and Cumulative Effects of Proposed Actions

This species has not been found on the Helena National Forest to date. The habitat is fens, which are limited in extent on the forest. The habitat also includes damp mossy woods, seepage areas, and moist forest-meadow ecotones in valleys and lower elevations in the mountains.

Determination

The decision may impact individuals but would not contribute toward a trend for federal listing or loss of viability.

SPECIES- Juncus hallii

Direct, Indirect, and Cumulative Effects of Proposed Actions

This species has fifteen populations Forest-wide, including eleven populations known from the Divide travel planning area. Of those eleven, four populations of this species are known from within or very close to road rights of way within the Divide travel planning area. See Table 3.82.

Alternatives 3 and 4 provide the best protection for the plant populations, by limiting all of the roads except 1859-B1 to over snow, when minimal damage would be done. Alternative 1 closes 1859-E1 year-

round, but leaves the other roads open. Overall Alternative 1 has potential for adverse impacts to the populations, although road 1859-E1 is close to the populations, and closing this route would benefit the populations. Alternative 2 would limit road 1863 to over snow, but would leave the other roads open. Alternative 2 would have the most potential to impact the species, as the populations are closer to road 1859-E1 than to road 1863.

Determination

The decision may impact individuals but would not contribute toward a trend for federal listing or loss of viability. The populations are all some distance from the road prisms and are within wet areas. This species would not be impacted by most herbicides. Road maintenance in this area would be designed to protect the populations.

SPECIES- Phlox kelseyi var. missoulensis

Direct, Indirect, and Cumulative Effects of Proposed Actions

This species is known from seven locations within road rights of way in the Divide travel planning area. See Table 3.83.

Alternative 4 would provide the best protection for known populations by closing a total of five routes motorized vehicles either totally, or allows only over snow vehicles, one more road than the other Alternatives. The additional route that is closed (road 1802-C1) is near a large population, and would provide additional protection although there are open roads near the population. Alternative 3 closes or limits travel to over snow vehicles on four routes. Alternatives 1 and 2 would have essentially the same (and the most) potential impact to this species by leaving all routes open to wheeled motorized vehicles.

Determination

The decision may impact individuals but would not contribute toward a trend for federal listing or loss of viability. Alternative 4 provides the best protection for populations, followed by Alternative 3. Alternatives 1 and 2 would have the most potential impact to the populations by leaving routes open.

SPECIES- Schoenoplectus subterminalis

Direct, Indirect, and Cumulative Effects of Proposed Actions

This species is known from the Indian Meadows RNA in the northern portion of the Forest in true fens. This species is associated with wetland habitats and fens which are limited on the Forest. This species was not found to-date in field surveys of potential wetlands in the area nor in FIA grid intensification which included the planning area.

Determination

The decision may impact individuals but would not contribute toward a trend for federal listing or loss of viability design criteria as described above would protect potential habitat.

NOXIOUS WEEDS

Regulatory Framework

Plant Protection Act

This act defines a noxious weed as “any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment” (7 *USC* 104 § 7702, 2000). Montana also has a Weed Control Act (7 *Montana Code* 22 §§

2101 et seq., 2003), and while Montana laws do not apply to federal lands, section 2814 of the Federal Noxious Weed Act of 1974, as amended (7 *USC* 61 § 2814, 1990)[11] requires that federal land management agencies "complete and implement cooperative agreements with state agencies regarding the management of undesirable plant species on federal lands under the agency's jurisdiction and establish integrated management systems to control or contain undesirable plant species targeted under cooperative agreements."

National Forest Management Act (NFMA)

The NFMA of 1976 (PL 94-588) under 36 *CFR* 219.10(b) states

(b) Sustaining ecological systems. The overall goal of the ecological element of sustainability is to provide a framework to contribute to sustaining native ecological systems by providing ecological conditions to support diversity of native plant and animal species in the plan area.

Federal Noxious Weed Act

This act of 1974 (7 *USC* 2801 et seq.; 88 Stat. 2148) provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.

FSM 2080 Supplement R1 2000-2001-1 (USDA 2001) provides required objectives and associated practices for resource groups.

The *HNF Forest Plan* (USDA 1986) outlines noxious weed management objectives and control measures. Page II/22 states

- Implement an integrated weed control program in cooperation with state of Montana and County Weed Boards to confine present infestations, and prevent establishing new areas of noxious weeds. Noxious weeds are listed in the Montana Weed Law and designated by County Weed Boards.
- Integrated Pest Management, which uses chemical, biological, and mechanical methods, would be the principal control method. Spot herbicide treatment of identified weeds would be emphasized. Biological control methods would be considered as they become available.
- Funding for weed control on disturbed sites would be provided by the resource that causes the disturbance.

The *HNF Weed Treatment Project FEIS* (USDA 2006) provides environmental standards and guidelines for control and management of noxious weeds, specifically the use and effects of herbicide application.

Montana Weed Control Act

This act was established in 1948 to protect Montana from destructive noxious weeds. This act, amended in 1991, established a set of criteria for the control and management of noxious weeds in Montana.

Assumptions

The following assumptions were used:

- The analyses and decisions made in the record of decision for the *HNF Weed Treatment Project FEIS* are incorporated in noxious weed analysis and management on the HNF. This includes all environmental protection measures.
- Any soil disturbing activity with mechanized equipment has the potential to increase noxious weed invasion or spread.

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[11] **The Plant Protection Act repealed all sections, except section 2814, of the Federal Noxious Weed Act of 1974.**

- The expected rate of spread of noxious weeds is 14% per year, (Asher and Spurrier 1998) without disturbance. The rate of spread could increase in areas affected by ground disturbing activities.
- Herbicide use in accordance with the requirements specified in the *HNF Weed Treatment Project FEIS* (USDA 2006) is appropriate for noxious weed management on infested lands.
- The Forest noxious weed treatment program would continue to treat approximately 30% of the weeds within the planning area annually, regardless of whether the project occurs or not.

The paragraphs below define mapped weed acres and weed treatment acres as used in this report.

Mapped Weed Acres: Mapped acres are reflected by polygons within which there is at least 1% noxious weed cover. There are weeds outside those polygons that are too scattered to map, or are infestations that have not been discovered yet. The mapped acres are taken from the layer containing invasives information, in the HNF Geographical Information Systems (GIS) database.

Weed Treatment Acres: Weed treatment acres for the purposes of this report are assumed to be the total polygon acres described above.

Design Elements

The following Best Management Practices are required by *FMS 2081.2—Prevention and Control Measures* (FSM 2080, 5/14/01) (USDA 2001).

Roads – Required Objectives and Associated Practices

Incorporate weed prevention into road layout, design, and alternative evaluation. Environmental analysis for road construction and reconstruction would include weed risk assessment.

Information Used

A geodatabase, which contains numerous geospatial layers, provided the data that was used in this analysis. This geodatabase is available in the project file. Those layers include the known locations of weed infestations, watershed and stream information; habitat types for risk assessment.

Methodology and Scientific Accuracy

The methodology used in this analysis includes the best available data from the Helena National Forest weeds database, Geographic Information System datasets, personal ground reconnaissance of the planning area and experience including vegetation monitoring from past vegetation treatment on the Helena National Forest. Literature review has been completed of available information on noxious weed species, habitat and the effects of disturbance on flora. Geographic Information Systems were used to combine various datasets and understand relationships and the effects of travel routes on weeds and other flora as well as influences from landform and landtypes.

This report is based on personal knowledge and observations made in the planning area from 2008-2012, by the range specialist. Data used to generate statistics and information regarding existing condition and affected environment were provided by the HNF GIS department in the form of a geodatabase, and based on inventories completed in field in the planning area in 2003, 2009, 2010, 2011 and 2012. All raw numbers and calculations can be found in the project file; numbers are rounded to the nearest whole number and nearest percent.

Noxious Weeds, Affected Environment

Analysis Area

Bounding for the analysis of cumulative effects of past, present and foreseeable future actions is also the planning area. Past actions are considered as part of the existing condition and future effects are considered for ten years into the future, which allows an adequate length of time to record vegetative changes relevant to the purpose of this project. Effects associated with various actions are based on literature, known weed infestations and personal experience.

The Divide travel planning area, 155,000 acres, was used as the indirect and cumulative effects analysis area for this project. A 100 foot wide buffer was applied to all routes within the planning area. This includes 1751 acres, and was used as the analysis area for direct effects. NRCS 6th code Hydrologic Unit Codes (HUCs) that had roads with noxious weed infestations within the buffer were used for the affected environment discussion and the pesticide delivery analysis.

Weeds have been expanding on the HNF for many years. A variety of factors has contributed to the spread of noxious weeds. There are over 23,000 acres of mapped noxious weed infestations on the HNF and over 5600 infested acres are in the Divide landscape, which includes the planning area. Noxious weeds are invasive by definition and are able to spread when there are no natural enemies, pathogens, or ungulate grazing to keep them in check. The spread of weeds is favored by wildfire and ground disturbance of any kind. More use by the public has occurred across the HNF in the past few years due in part to increased OHV use, recreation displacement from wildfire areas, and travel plan closure areas, which place more pressure on the remaining open areas.

Various methods of weed control are used. Herbicide application is the most common form of control used in the planning area. This analysis tiers to the *HNF Weed Treatment Project FEIS* (USDA 2006) which provides environmental requirements and guidelines regarding noxious weed treatment and herbicide effects. The Forest treats approximately one-third of the mapped weed on an annual basis under the normal weed treatment program. The areas scheduled for treatment in a given year are a combination of: acres associated with projects with ground disturbing activities; travel and recreation corridors; and re-treatment of existing infestations. Effectiveness monitoring is used to prioritize the roads and polygons that need re-treatment. Results of spray effectiveness monitoring are located in records kept by the Forest weed specialist.

There are over 23,000 acres of mapped noxious weed infestations on the Helena National Forest. There is an ongoing effort to accurately map the extent of weeds as new infestations start every year, and old infestations often expand.

Roads have high weed infestations due to several reasons: vehicles carry weed seeds, which are dispersed along travelways; roads are disturbed by maintenance activities on a regular basis, which provides a ready seedbed for weed seeds, both the seeds dispersed by vehicles and those that are carried on the wind or by animals and birds; human use is concentrated along roadsides which increases the exposure of these areas to noxious weed seed dispersal (Lonsdale, 1999; Pauchard et al., 2003).

Current Condition with Planning Area and Buffered Roads

The Divide travel planning area includes approximately 155,000 acres. Within the Divide travel planning area approximately 3178 acres are currently infested with noxious weeds. The majority of these areas were infested from light (less than 5%) to high (50% canopy cover of weeds). This represents approximately 14% of the mapped noxious weed infestations on the Forest. The areas affected by this project are all along roadsides, and, as described above, these areas are susceptible to noxious weed infestation.

The following table shows the miles of motorized routes within the analysis area.

Table 3.84 Current Condition Summary Comparison of Roads and Motorized Trails Mileage

Use	Miles
Motorized Route	344
Non Motorized Route	147

The following species of noxious weeds have been identified in the Divide travel planning area:

Table 3.85 Mapped Noxious Weed Infestations within the proposed planning area

Primary Noxious Weed Species	Infested Acres
Spotted knapweed (*Centaurea maculosa*)	1729
Canada thistle (*Cirsium arvense*)	1312
Leafy spurge (*Euphorbia esula*)	34
Oxeye daisy (*Leucanthemum vulgare)*	21
Dalmation toadflax (Linaria dalmatica)	17
Sulfur cinquefoil (*Potentilla recta*)	65
Total Acres	3178

Roads and trails are known vectors for noxious weed infestation and spread (Lonsdale, 1999; Pauchard et al., 2003). There are 1751 acres within a 100 foot buffer of the motorized routes in the analysis area. The following table shows the acres infested with noxious weeds within the 100 foot buffer of all travel routes in the planning area.

Table 3.86 Mapped Noxious Weed Infestations within the buffered travel routes:

Primary Noxious Weed Species	Infested Acres
Spotted knapweed (*Centaurea maculosa*)	1036
Canada thistle (*Cirsium arvense*)	695
Leafy spurge (*Euphorbia esula*)	<1
Oxeye daisy (*Leucanthemum vulgare)*	17
Dalmation toadflax (Linaria dalmatica)	3
Total Acres	1751

There are eight State of Montana noxious weed species of primary concern in terms of level of infestation in the treatment area: spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense),* leafy spurge (*Euphorbia esula*),), oxeye daisy (*Leucanthemum vulgare*), Dalmation toadflax (*Linaria dalmatica*), common toadflax (*Linaria vulgare*), Orange hawkweed (*Hieracium aurantiacum*) and sulfur cinquefoil (*Potentilla recta*). Cheatgrass (*Bromus tectorum*), although not listed as a noxious weed in the state of Montana, is considered a “regulated plant” by the State, and is a species of concern on the HNF.

Many infested areas have more than one weed species present; this table shows the predominant species in a given area. Other common noxious weeds associated with the “primary” weeds shown above include butter and eggs (*Linaria vulgaris*). In addition, a given infestation may have more than one of the primary weed species present. For example, spotted knapweed may be the primary mapped species, but Canada thistle is often present as well. Detail on additional species in a given infestation is available in the GIS layer available in the project file.

Spotted knapweed (*Centaurea maculosa*) has the largest extent of infestation within the planning area. The species occurs along roadsides and throughout south facing areas of past harvest, as well as in the natural grasslands. Spotted knapweed thrives in open areas, with forest canopies of less than 20% closure. Spotted knapweed spreads almost entirely by prolific seed production (Zouhar 2001a). This species has also been shown to have allelopathic properties, secreting toxins that suppress the growth of other plants, although resource competition is just as effective in its ability to dominate areas (Zouhar 2001a).

Canada thistle (*Cirsium arvense*) has been mapped on a smaller area as compared to spotted knapweed. This species spreads primarily by adventitious root buds that may form new adventitious shoots can develop along the root at any location (Zouhar 2001b). Canada thistle is present in much of the planning area, generally associated with roadside disturbance or harvest disturbance. Its habitat is restricted to open areas of less than 10% canopy closure.

Orange hawkweed (*Hieracium aurantiacum*) is one of the most dangerous weeds in the planning area (Stone 2010), although it is known only from one location in the planning area. Orange hawkweed forms a monoculture by establishing a dense mat of plants, lowers biodiversity and reduces the forage value of grasslands for grazing animals. This plant is a successful competitor, crowding out native, pasture and range species (Prather et al. 2003). Hawkweed species are allelopathics (Murphy and Aarssen 1995). It hybridizes freely with native and non-native hawkweeds (Rinella and Sheley 2002).

Leafy spurge (*Euphorbia esula*) is found in limited acreage within the planning area. Leafy spurge generally grows in clumps, producing stems up to 3 feet tall from caudices, rhizomes, and roots. It has an extensive underground rhizome and root system. Roots can penetrate into the soil as far as 15 to 30 feet. Leafy spurge can rapidly invade disturbed sites by establishing from seed and by sprouting from existing roots and root crowns. Once established, leafy spurge tends to expand and persist (Simonin 2000, Gucker 2010).

Sulfur cinquefoil (*Potentilla recta*) has limited mapped acreage. Populations in North America are commonly associated with roadsides, vegetation disturbance, abandoned agricultural fields, and "waste areas." Sulfur cinquefoil can also invade native plant communities that are far from any apparent human disturbance and is now common in natural grasslands and shrubby areas (Zouhar 2003c).

Oxeye daisy (*Leucanthemum vulgare* also known as *Chrysanthemum leucanthemum)* is found along numerous roads and trails in the Divide landscape area, although its mapped acreage is limited. Besides reproducing vegetatively along a rhizome, oxeye daisy is a prolific seed (achene) producer. (Olson and Wallander,1999). Oxeye daisy reduces plant species diversity in infested areas. Grazing by cattle in infested areas intensifies its spread because they avoid the plant. Consequently, it forms dense populations. Oxeye daisy has the potential of increasing soil erosion because bare soil is more prominent in areas where high densities occur. Cultivation destroys oxeye daisy’s shallow root system without difficulty (Mitich, 2000). This plant can become noxious and is capable of taking over and modifying natural areas, pasture and rangeland and may increase soil erosion compared to native plant communities (Olson and Wallander 1999)

Dalmation toadflax (*Linaria dalmatica*) has a limited mapped acreage in the planning area. Toadflax has been shown to readily establish on open and disturbed sites where competition from other plants is reduced (Zouhar 2003b). Dalmatian toadflax seeds may be dispersed by cattle, deer and other browsing animals, and the seeds can remain viable after passing through the gastrointestinal tracts of cattle, and

possibly deer. This species can also expand vegetatively by the formation of adventitious shoots from both the tap and lateral roots (Zouhar 2003b). There is serious risk of infestation from Dalmation toadflax, even though current infestation levels are thought to be very low. Weeds are expected to increase in level of infestation and acres infested overall in the planning area in spite of the efforts of herbicide application for control. Weed seeds are stored in the upper soil layers, and will germinate over several years. This species is difficult to control.

Common yellow toadflax, or butter and eggs, (*Linaria vulgaris*) infestations may be included in the Dalmation toadflax mapped acreage for this planning area. The two species have similar characteristics. Butter and eggs has been shown to readily establish on open and disturbed sites where competition from other plants is reduced (FEIS, 2004c). The seeds may be dispersed by water, ants, birds, and rodents, but existing infestations of butter and eggs appear to expand mainly by vegetative reproduction rather than by seed (Pauchard et al., 2003; FEIS, 2004c). There is serious risk of infestation from yellow toadflax even though current infestation levels are thought to be very low.

Cheatgrass (*Bromus tectorum*) is a serious weed that competes with native vegetation and fuels wildfires (Young et al. 1987). Cheatgrass is listed as a regulated species on the Montana State Noxious Weed list and has not been mapped on the HNF. It is established along numerous roadsides and other areas of disturbance in Montana. Cheatgrass spread rapidly through sagebrush ranges following World War II and has been expanding its range ever since. Disturbance by spring grazing or even rodent activity is sufficient to perpetuate cheatgrass reproduction (Zouhar 2003a). Cheatgrass is highly adaptable and has increased on lands around the HNF over the past 30 years.

Noxious Weeds, Environmental Consequences

Indicators used to disclose environmental effects of the alternatives are:

- Predicted acres of noxious weed infestation within 100 foot buffer of motorized routes with the associated management cost for weed control activities; and,
- Qualitative comparison of risk of noxious weed infestation between alternatives.

Effects Common to All Alternatives

The Forest treats approximately one-third of its mapped weeds on an annual basis under its normal weed treatment program; therefore, one-third, or 525 of the 1751 acres of weeds along travel routes, would be treated annually. Herbicide treatment of these acres would have an average cost of about $30 per acre for easily accessible sites (≤200 feet of a road and on slopes <40%) and $62 per acre for areas with more difficult terrain (>200 feet from a road and on slopes >40%). The cost of bio-control is included in these prices. An average cost of $50/acre is used to calculate costs.

Table 3.87 displays treatment type and cost to treat one-third of the acres in the planning area. This table does not include the cost of monitoring. This cost is not included in further analysis of the alternatives as it is assumed to be a baseline, independent of management actions, and common to all alternatives.

Table 3.87 Treatment Type and Cost to Treat One-Third of Infested Acres—All Alternatives

Treatment Type	Average Cost/Acre	Acres	Average Total Cost
Herbicide/Bio-control	$50.00	525	$26,250

Current weed management activities would continue under all alternatives. Chemical weed treatments would be used in areas accessible to ground spraying equipment. Roadside infestations would be treated

on a scheduled basis. Bio-control would be used in areas where the biological agents had optimal conditions for survival and expansion. In riparian areas, biological control would be emphasized where conditions for insect establishment are met.

Public access for recreation, firewood collection, and private property access would continue along roadsides. Also, forest users would be free to use all existing dispersed recreation sites and other open areas, except during spring break-up when the road surfaces are over saturated with moisture (USDA 2010). The ground disturbance associated with these activities would likely increase weed infestations where bare soil is exposed. The area immediately adjacent to the roads would continue to be the most vulnerable to weed infestation due to several factors: weed seed from vehicles would be likely to detach along the roadsides; these areas are disturbed when roadsides are bladed with heavy machinery; weed seed can be on the machinery or in the soil that is spread along the maintained area. The exposure to road and trail routes is high due to constant delivery of weed seed from vehicles, humans and animals. The more vehicles that travel the routes, the higher the exposure.

Weeds could be expected to increase by an estimated 14% without disturbance (Asher and Spurrier 1998). The most susceptible forest habitat types would be dry habitat types that have existing infestations of noxious weeds due to the natural openness of such forest types.

New weed infestations would occur under all alternatives, particularly along roadsides and areas of disturbance (Lonsdale 1999). The *HNF Weed Treatment Project FEIS* (USDA 2006) provides guidance and environmental requirements for weed control activities that would be applied to this area under any alternative. The forest currently uses herbicides to treat approximately 30% of infestations annually. Roadsides would be treated on a scheduled basis, as they are a major vector for weed invasion. There is also a bio-control program on the forest that has been successful in establishing insectories. Bio-control would be used in areas where the biological agents had optimal conditions for survival and expansion. In riparian areas, biological control would be emphasized where conditions for insect establishment are met.

Native plant diversity would be impacted by infestations of non-native plants, especially noxious weeds. Noxious weeds dominate plant communities and tend to form monocultures that negatively impact native biological diversity. This weed competition to individual plants and plant communities can result in loss of species diversity and sensitive native plants. Native grasses used for domestic livestock and wild ungulates have been particularly susceptible to impacts from weeds (Beck 2001).

Irreversible/Irretrievable Commitments

The effects of noxious weed infestations are adverse to native fauna and flora and present the greatest large-scale threat to native ecosystems that exist in the Nation's wild lands today (Lonsdale 1999; DiTomaso 2000; Mack et al. 2001; Lodge and Shrader-Frechette 2003; Pauchard et al. 2003). At high infestation levels these effects are adverse due to the loss of native plant diversity, reduction of wildlife habitat and forage, increase in erosion and depletion of soil moisture and nutrient levels (DiTomaso 2000). These effects are common to all alternatives due to the effects of noxious weeds whether ground disturbance occurs or not. If noxious weed populations are not controlled, these effects could be irreversible.

Effects Common to All Action Alternatives

While the spread of noxious weeds would continue under all alternatives, the rate of spread could potentially be faster in areas proposed to change from no motorized use to open for motorized use. Noxious weed infestations are introduced and spread through most ground disturbing activities (Young et al. 1987; Lonsdale 1999; Zouhar 2001a, 2002b, 2003b; King County 2007). Vehicles that travel the National Forest road and trail system provide a source of weed seed as well as a chronic disturbance along those corridors. Weed management would continue as in the past with the addition of management in areas

that have ground disturbance through this project. Areas of ground disturbance would be monitored for weed infestations and treated as appropriate, in accordance with the *HNF Weed Treatment Project FEIS* (USDA 2006) and Best Management Practices (BMPs) as specified in *FSM 2080* (USDA 2001), and the Helena National Forest Plan. Chemical weed treatments would be the primary treatment method along roadside areas as those areas are accessible to ground spraying equipment. Bio-control would be used in areas where the biological agents had optimal conditions for survival and expansion. In riparian areas, biological control would be emphasized where conditions for insect establishment are met. The effect of all treatment methods would be to control and contain existing and new infestations related to open roads and trails.

Some weeds, such as Dalmation toadflax, leafy spurge, houndstongue and sulfur cinquefoil spread readily without ground disturbance, and spread very rapidly with disturbance (FEIS 2004b; FEIS 2004c; FEIS 2009c; FEIS 2009e). Weed control efforts in the form of herbicide treatment and biological control provide beneficial effects undertaken over time to control existing and new infestations.

For the purpose of calculating potential weed infestation in the treatment areas, moderate risk is equated to approximately 10% soil surface disturbance of the potential acres affected, and high risk is equated to 100% soil surface disturbance of the acres affected.

The *HNF Weed Treatment Project FEIS* (USDA 2006) identified several 6th code HUCs in which herbicide application would be limited based on the amount of herbicide applied, the location of the application, the stream flow, and HUC area. The estimates of the amount to be applied if all acres were treated are shown by HUC. The rationale for that determination is from the coarse filter calculation to estimate possible concentrations of herbicide in stream waters. No HUCs would exceed the limit identified through modeling.

Cumulative Effects

The cumulative effects area for noxious weeds is the Divide travel planning area (179,000 acres). The rationale for this area is that the potential for ground disturbing activities which could contribute to noxious weed spread is captured. Cumulative effects are addressed under each of the alternatives. The cumulative effects that are described include ongoing actions that are assumed to have effects beginning shortly following the action, and will continue into the future. Effects associated with various actions are based on literature, known weed infestations, and personal experience.

Past activities have contributed to the previously described affected environment and would be accounted for in the most recent weed inventory data.

Ongoing activities include: roadside hazard tree reduction implementation (491 miles); timber harvest on private lands and other private land activities; noxious weed treatment on national forest system lands; livestock grazing allotments; and small mining operations.

Alternative 1, No Action

Direct and Indirect Effects

No additional ground disturbance beyond that described in “Effects Common to All Alternatives” would occur under this alternative. Weeds would continue to spread at a rate of approximately 14% per year. Treatment of the currently mapped noxious weeds within roadside areas would average about $50.00 per acre; this does not include costs for any monitoring activities.

Under this alternative there are approximately 1155 acres of noxious weed associated with motorized routes, 495 acres of noxious weeds associated with non-motorized routes, and 101 acres of weeds

associated with the Continental Divide National Scenic trail (CDNST). A spreadsheet showing the weeds on a given route as well as a map can be found in the project file.

Generally a given roadside is treated with Tordon every two to three years rather than annually. Using the average annual treatment cost of $50 per acre and assuming one-third of the infestations would likely be treated, for the existing condition 525 acres would be treated at a total cost of $26,250 for Alternative 1.

The following table shows the estimated costs within the planning area (100 foot road buffer) for this alternative and assumes that 30% of a population is treated each year.

Table 3.88 Acres infested with noxious weeds by type of route and cost of treatment

Type of Route	Infested Acres	30% of Infested Acres	Treatment Costs/Acre	Total Cost Treating 30% per year
Motorized	1155	346.5	$30.00	$10,395
Non-motorized	495	148.5	$70.00	$10,395
CDNST	101	30.3	$30-$70	$1,515
Total	1751	525.3	--	$22,305

The following table shows a qualitative comparison of risk of weed infestation and/or expansion due to various factors.

Table 3.89 Qualitative comparison of risk by type of route

Type of Risk	Motorized Routes	Non –motorized Routes
Amount of area exposed	Motorized routes (344 miles) are 57% higher than non-motorized routes (147 miles)	
Frequent exposure to weed seed	Very high (-ve)	Low (+ve)
Likelihood of treatment	High (+ve)	Low (-ve)
Longterm impact on native flora	High (-ve) due to herbicde effects and introduced species	High (-ve) due to infestation level without treatment
Risk of new infestations	High (-ve)	Low (+ve)

Irreversible/Irretrievable Commitments

This alternative has the highest potential for adverse effects, due to the number of acres of current infestation along a 100 foot of routes (1155) and the percentage motorized routes are of all routes (57).

Cumulative Effects

The existing condition reflects the effect of past disturbances as well as the effect of noxious weed control efforts. Please refer to the cumulative effects table in Appendix B for a specific description of the effect of past, present and foreseeable activities on noxious weed infestations.

Ongoing activities: Weed expansion would continue to occur under the No Action Alternative in association with ongoing activities at a rate of approximately 14 percent per year (Asher, 1998). Ground disturbance associated with the following projects would likely cause noxious weed expansion in the cumulative effects area:

- Grazing Allotments – in areas where cattle congregate such as salt grounds. Disturbed soil in these areas would be susceptible to weed infestation. Grazing allotments are monitored annually and noxious weed infestations are treated as part of the forest-wide noxious weed treatment program.
- Roadside Hazard Tree Removal – this project includes approximately 491 miles of harvest along existing roads in the planning area in the short-term. Noxious weed treatment (herbicide) is required on all harvest units before and after harvest.
- Private Land Tree Activities – Tree removal would be expected to continue as trees continue to die due to the mountain pine beetle. Ground disturbance associated with road construction and logging operations would likely cause noxious weed population expansion in the cumulative effects area. Private land operations are governed by Montana state law to control noxious weed populations.
- Mining operations – there are numerous small mining operations ongoing. All plans of operations require weed treatment of all ground disturbance.
- Forest Noxious Weed Treatment Program – the Herbicide treatment is primarily along roads and in patches that are accessible to mechanized equipment (spraying with ATVs) and/or by hand, biological (insects), goats/sheep, and aerial spraying. Areas for treatment are as identified in the EIS/ROD and continually being updated and treated as new infestations are located. The program would continue to treat approximately 30% of the weeds within the planning area.

There are no other foreseeable actions that would have cumulative effects with this alternative.

Alternative 2

Direct and Indirect Effects

No additional ground disturbance beyond that described in “Effects Common to All Alternatives” would occur under this alternative. Weeds would continue to spread at a rate of approximately 14% per year. Treatment of the currently mapped noxious weeds within roadside areas would average about $50.00 per acre; this does not include costs for any monitoring activities.

Under this alternative there are approximately 833 acres of noxious weed associated with motorized routes, 817 acres of noxious weeds associated with non-motorized routes, and 101 acres of weeds associated with the Continental Divide Scenic trail.

Generally a given roadside is treated with Tordon every two to three years rather than annually. Using the average annual treatment cost of $50 per acre and assuming one-third of the infestations would likely be treated, for the existing condition 525 acres would be treated at a total cost of $26,250.

The following table shows the estimated costs within the planning area (100 foot road buffer) for this alternative, assuming that 30% of a population is treated each year.

Table 3.90 Acres infested with noxious weeds by type of route and cost of treatment

Type of Route	Infested Acres	30% of Infested Acres	Treatment Costs/Acre	Total Cost Treating 30% per year

Type of Route	Infested Acres	30% of Infested Acres	Treatment Costs/Acre	Total Cost Treating 30% per year
Motorized	833	249.9	$30.00	$7,497
Non-motorized	817	245.1	$70.00	$17,157
CDNST	101	30.3	$30-$70	$1,515
Total	1751	525.3	--	$26,169

The following table shows a qualitative risk rating of various factors for motorized and non-motorized routes.

Table 3.91 Qualitative Comparison of risk by type of route

Type of Risk	Motorized Routes	Non –motorized Routes
Amount of area exposed	Motorized routes (339 miles) are 54% higher than non-motorized routes (156 miles)	
Frequent exposure to weed seed	Very high (-ve)	Low (+ve)
Likelihood of treatment	High (+ve)	Low (-ve)
Longterm impact on native flora	High (-ve) due to herbicde effects and introduced species	High (-ve) due to infestation level without treatment
Risk of new infestations	High (-ve)	Low (+ve)

The cost of treatment for this alternative would be essentially the same as the existing condition. The overall weed acreage within the planning area would not be affected in the short term. With fewer miles of motorized routes in particular, the acres of weeds inside the buffer would be reduced. Over time this would mean less exposure to weed seed and disturbance. This alternative would have similar but lower impacts in terms of noxious weeds as compared to the existing conditions.

Irreversible/Irretrievable Commitments

This alternative has the second least potential for adverse effects, due to the number of acres of infestation along a 100 foot of motorized routes (833) and the percentage motorized routes are of all routes (56).

Cumulative Effects

Cumulative effects under Alternative 2 would be similar to those identified under Alternative 1. There would be fewer infested acres along motorized route and fewer motorized routes associated with Alternative 2, so some effects would be expected to be less with this alternative as compared to Alternative 1.

There are no other ongoing or foreseeable actions that would have cumulative effects with this alternative.

Alternative 3

Direct and Indirect Effects

No additional ground disturbance beyond that described in "Effects Common to All Alternatives" would occur under this alternative. Weeds would continue to spread at a rate of approximately 14% per year. Treatment of the currently mapped noxious weeds within roadside areas would average about $50.00 per acre; this does not include costs for any monitoring activities.

Under this alternative there are approximately 853 acres of noxious weed associated with motorized routes, 797 acres of noxious weeds associated with non-motorized routes, and 101 acres of weeds associated with the Continental Divide Scenic trail.

Generally a given roadside is treated with Tordon every two to three years rather than annually. Using the average annual treatment cost of $50 per acre and assuming one-third of the infestations would likely be treated, for the existing condition 525 acres would be treated at a total cost of $26,250.

This alternative would result in lower acres of infested acres within the 100 foot buffer along motorized routes. The following tables show the route use mileages and the acres infested with noxious weeds within the 100 foot buffer of travel routes in the planning area.

The following table shows the estimated costs within the planning area (100 foot road buffer) for this alternative, assuming that 30% of a population is treated each year but using more the more treatment specific cost estimates found in Appendix A.

Table 3.92 Acres within the buffered area currently infested with weeds by type of route

Type of Route	Infested Acres	30% of Infested Acres	Treatment Costs/Acre	Total Cost Treating 30% per year
Motorized	853	255.9	$30.00	$7,677
Non-motorized	797	239.1	$70.00	$16,737
CDNST	101	30.3	$30-$70	$1,515
Total	1751	525.3	--	$25,929

The following table shows a qualitative risk rating of various factors for motorized and non-motorized routes.

Table 3.93 Qualitative Comparison of risk by type of route

Type of Risk	Motorized Routes	Non –motorized Routes
Amount of area exposed	Motorized routes (272 miles) is approximately 18% higher than non-motorized routes (223 miles)	
Frequent exposure to weed seed	Very high (-ve)	Low (+ve)
Likelihood of treatment	High (+ve)	Low (-ve)
Longterm impact on native flora	High (-ve) due to herbicde effects and introduced species	High (-ve) due to infestation level
Risk of new infestations	High (-ve)	Low (+ve)

Alternative 3 has the lowest number of miles of motorized routes as compared to the existing condition and the other two action alternatives, and therefore the lowest number of noxious weeds associated with the motorized routes. This alternative would have the lowest impacts of the three alternatives in terms of noxious weed infestations, and potential for future noxious weed spread.

Irreversible/Irretrievable Commitments

This alternative has the least potential for adverse effects, due to the number of acres of infestation along a 100 foot of motorized routes (853) and the percentage motorized routes are of all routes (31).

Cumulative Effects

Cumulative effects under Alternative 3 would be similar to those identified under Alternative 1. There would be fewer infested acres along motorized route and fewer motorized routes associated with Alternative 3, so some effects would be expected to be less with this alternative as compared to Alternative 1.

There are no other ongoing or foreseeable actions that would have cumulative effects with this alternative.

Alternative 4

Direct and Indirect Effects

No additional ground disturbance beyond that described in “Effects Common to All Alternatives” would occur under this alternative. Weeds would continue to spread at a rate of approximately 14% per year. Treatment of the currently mapped noxious weeds within roadside areas would average about $50.00 per acre; this does not include costs for any monitoring activities.

Under this alternative there are approximately 1070 acres of noxious weed associated with motorized routes, 580 acres of noxious weeds associated with non-motorized routes, and 101 acres of weeds associated with the Continental Divide Scenic trail.

Generally a given roadside is treated with Tordon every two to three years rather than annually. Using the average annual treatment cost of $50 per acre and assuming one-third of the infestations would likely be treated, 525 acres for a total of $26,250 for the existing condition.

This alternative would result in lower acres of infested acres within the 100 foot buffer along motorized routes. The following tables show the route use mileages and the acres infested with noxious weeds within the 100 foot buffer of travel routes in the planning area.

The following table shows the estimated costs within the planning area (100 foot road buffer) for this alternative, assuming that 30% of a population is treated each year but using more the more treatment specific cost estimates found in Appendix A.

Table 3.94 Acres within the buffered area currently infested with weeds by type of route

Type of Route	Infested Acres	30% of Infested Acres	Treatment Costs/Acre	Total Cost Treating 30% per year
Motorized	1070	321	$30.00	$9,630
Non-motorized	580	174	$70.00	$12,180
CDNST	101	30.3	$30-$70	$1,515
Total	1751	525.3	--	$23,325

The following table shows a qualitative risk rating of various factors for motorized and non-motorized routes.

Table 3.95 Qualitative Comparison of risk by type of route

Type of Risk	Motorized Routes	Non –motorized Routes
Amount of area exposed	Motorized routes (285 miles) is approximately 26% higher than non-motorized routes (210 miles)	
Frequent exposure to weed seed	Very high (-ve)	Low (+ve)
Likelihood of treatment	High (+ve)	Low (-ve)
Longterm impact on native flora	High (-ve) due to herbicde effects and introduced species	High (-ve) due to infestation level
Risk of new infestations	High (-ve)	Low (+ve)

Alternative 4 has the second lowest number of miles of motorized routes as compared to the existing condition, and therefore the second lowest number of noxious weeds associated with the motorized routes. This alternative would have lower impacts than alternatives 1 and 2 in terms of noxious weed infestations and potential for future noxious weed spread and slightly more impacts than alternative 3.

Irreversible/Irretrievable Commitments

This alternative has the second most potential for adverse effects, due to the number of acres of infestation along a 100 foot of motorized routes (1070) and the percentage motorized routes are of all routes (50).

Cumulative Effects

Cumulative effects under Alternative 4 would be similar to those identified under Alternative 1. There would be fewer infested acres along motorized routes and fewer motorized routes associated with Alternative 4, so some effects would be expected to be less with this alternative as compared to Alternative 1.

There are no other ongoing or foreseeable actions that would have cumulative effects with this alternative.

Conclusions

The table below shows by alternative the predicted acres of noxious weed infestation within a 100 foot buffer of all routes types, the predicted acres of noxious weed infestation and treatment costs by motorized and non motorized route type. This table represents the worst-case scenarios of projected invasion based on the route type and the potential for ground disturbance. This is considered a worst case scenario as it does not include the probability of herbicide control of new and existing populations. Control and/or containment would be expected at some level, but it would be highly speculative to identify the degree of control.

Table 3.96 Comparison of Weed Infestation and Treatment Costs by Alternative

Route status	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Motorized route mileage	344	339	272	285
Acres infested along 100 feet buffer of motorized route	1155	833	853	1070
Cost to treat 30% of infested acres of motorized routes ($30/acre)	$10,395	$7,497	$7,677	$9,630
Non motorized route mileage	147	156	223	210
Acres infested along 100 feet buffer of non motorized route	495	817	797	580
Cost to treat 30% of infested acres of non motorized routes ($70/acre)	$10,395	$17,157	$ 16,737	$12,180
Acres infested along 100 feet buffer of CDNST route	101	101	101	101
Cost to treat 30% of infested acres on CDNST route ($50/acre)	$1,515	$1,515	$ 1,515	$1,515
Total cost to treat 30% infested acres	**$22,305**	**$26,169**	**$ 25,929**	**$23,325**
Percent change in treatment total costs from Alt 1		15%	14%	4%
Percent change in treatment total costs from average ($50/acre, $26,250 total)	-18%	0%	-1%	-13%
Percent more motorized routes than non motorized	57%	54%	18%	26%

Alternative 2 has the lowest amount of noxious weed infested acres within a 100 foot route buffer of motorized routes and the highest management cost for noxious weed control when comparing all alternatives.

The detailed estimated cost to treat 30 percent of the infested acres on all route types is less than the cost calculated by using the average cost of treatment per acre.

Forest Plan Consistency

The effects of the action alternatives upon noxious weeds would remain within Forest Plan standards because it is consistent with management guidelines with the design criteria implemented where appropriate. There are no specific management area standards for noxious weed management in the Forest Plan. This document tiers to the decision in the Noxious Weed EIS and ROD which prescribes specific guidance for noxious weed management on the HNF.

ECONOMICS

Regulatory Framework

The preparation of NEPA documents is guided by CEQ regulations for implementing NEPA (40 CFR 1500-1508). NEPA requires that consequences to the human environment be analyzed and disclosed. The extent to which these environmental factors are analyzed and discussed is related to the nature of public comments received during scoping. NEPA does not require a monetary benefit-cost analysis (40 CFR 1502.23).

Assumptions

In general, economic effects associated with any change in management vary mainly by the total amount of spending and by the type of activity, but it cannot be generalized that motorized or non-motorized activities contribute more or less to the local economy on a per visit basis because the number of visits per party group also vary across activities.

Trail Management Costs

The following trail maintenance cost estimates are provided for work under any of the alternatives with the following caveats:

- A well designed motorized trail could cost less than this estimate.
- Estimate is using actual figures for maintaining at less than optimum trail design.
- Trails passing through burns will always cost more to maintain.
- Estimates based on contracting costs. Estimates do not take Forest crew costs into account.

Table 3.97 Trail Management Costs

Trail Category	Annual Maintenance Cost
Trails open to motorcycle seasonally	$90 / mile
Trails open to Motorcycle yearlong	$150 / mile
Trails open to 50" or less seasonally	$500 / mile
Trails open to 50" or less yearlong	$750 / mile
New trail construction for 60 inch width*	$17,000 / mile

** Trails constructed as connectors of roads or trails for OHV use (60" width tread, pack and saddle standard clearing limit: 8'x10', includes clearing, grubbing, excavation and rolling dip construction at 100' intervals. Mobilization cost/mile and Contracting officer's representative time for administration both included in this estimate.*

Information Used

Economic information used to describe the affected environment is compiled from various primary government sources. There is no new data collected specifically for this analysis. Existing county-level and national forest-level data is used to describe trends in the regional economy. County economic profiles are available from the Economic Profile System (EPS), which compiles and digests primary population and economic data from a variety of government sources into a report. Recent EPS reports, which include data up to 2010, provide a recent description of the population, employment, and income composition of the counties comprising the economic impact area for the Divide travel planning area. The recent economic

conditions vary for the five counties that have land in the planning area. Highlights of the EPS reports are presented below to describe the economies that may be impacted by the Divide travel plan decision. As a result of the small number of firms in area counties, employment and income figures were not available for some sectors of the economy due to disclosure restrictions.

Wildland dependency data, based on the percent of total labor income (employee compensation and proprietor income) earned in five resource areas, is obtained from Gebert and Odell (2006). In these calculations the portion of labor income earned in economic sectors associated with each of five resource areas have been calculated for 1993 and 2003. Although these numbers cannot support thorough trend analysis, as they are only two snapshots in time, they do provide some important information.

Methodology and Scientific Accuracy

National Travel Management Rule Benefit Cost Analysis

When the travel management rule was developed, the Forest Service considered the consequences in a qualitative cost benefit analysis. The following text and Table 3.98 are extracted from that analysis.

"The benefits and costs of the final rule are described qualitatively because the rule is procedural. Actual transportation decisions will be made at the local level with public input and appropriate environmental analysis and documentation. Neither the costs nor benefits are readily quantifiable, and thus this analysis discusses the costs and benefits to the extent information is available (Table 3.98). The benefits of the final rule include gains to users, the agency, and the environment. Sustainable, reliable, high-quality public access to National Forest System lands will lead to enhanced recreation opportunities for visitors. In addition, both users and the agency will benefit from improved public communication, more effective law enforcement, and improved travel management planning. Other benefits include reduced environmental damage and a more consistent and defensible travel planning framework. The costs of the final rule include reductions in unconstrained cross-country motor vehicle use for those that value this activity, and short-term agency planning costs as many national forests launch travel planning efforts following adoption of the rule."

Table 3.98 Costs and Benefits of Final Travel Management Rule

Potential Impacts	**Current Rule**	**Final Rule**
Public Communication	User confusion from inconsistent policy among national forests. Lack of compliance due to uncertainty and inconsistency of policy.	Increased user benefits and decreased agency management costs due to increased public involvement, user awareness, cooperation with user groups, access, and route management.
Public Safety	Unmanaged user-created routes have potential safety issues. Law enforcement effectiveness limited by inconsistent regulatory framework.	Increased public safety due to better trail design and management Increased law enforcement effectiveness and increased user benefits due to consistent regulatory framework
Travel System Maintenance and Management	Many unmanaged, unmaintained routes result in deterioration of routes and	Decreased loss of environmental benefits result from a sustainable system of managed, maintained and enforced routes

Potential Impacts	Current Rule	Final Rule
	environmental impacts.	
Short Run Planning Costs	Increased agency planning costs as National Forests take on travel management issues individually without consistent framework.	Increased agency planning costs because many National Forests will launch travel planning
Long Run Planning Costs	Travel management costs continue at high levels without national direction.	Decreased agency planning costs because of known framework and established system.
User Benefits	Potential loss of recreation opportunities over time as use conflicts and environmental damage lead to route and area closures	Increased user benefits, including enhanced recreation opportunities, improved natural environmental setting, reduced user conflicts, and enhanced opportunities for cooperative construction and maintenance of routes because of long-term sustainability and legitimacy of route system. Potential decrease in some user benefits because of loss of unconstrained cross-country motor vehicle use.
Environment	Erosion, sedimentation, and damage to fish and wildlife habitat from unmanaged cross-country motor vehicle use.	Increased environmental benefits due to reduction in erosion, sedimentation, and habitat destruction that result from unmanaged cross-country motor vehicle use.

Economics, Affected Environment

Analysis Area

The analysis area for the environmental assessment includes Deerlodge, Silver Bow, Jefferson, Lewis and Clark and Powell counties in Montana. Access management activities within the planning area have the potential to mainly impact the economic conditions of the communities in these counties.

Modeling of economic impacts using input/output analysis is often conducted to estimate the expected changes in the contribution of jobs and labor income to local economies following management decisions. In order to model changes to jobs and income, expectations for changes in forest visitation are needed. Due to a dearth of recreation impact monitoring data from similar travel planning decisions, no recreation visitation impacts are provided for the Divide area. In lieu of this information, response coefficients are sometimes derived. Response coefficients, which are reported here based on changes in the final demand for certain activities, indicate the number of full and part-time jobs and dollars of labor income per thousand national forest party trips per activity type. However, due to the fact that national visitor use monitoring NVUM data represents all activity on each national forest and is not broken down to describe just the Divide travel planning area, and the uncertainty regarding recreational visitation

changes/displacement that may occur following travel management decisions, and an economic impact analysis was not conducted for this assessment. Instead, the analysis focuses on recent economic dependency data, provides response coefficients and professional judgment regarding the likely change in the contribution of the national forest system lands in the planning area to the five-county economic impact area.

The combination of small towns and rural settings, along with people from a wide variety of backgrounds, provide a diverse social environment for the geographical region around the Helena Ranger District of the Helena National Forest. Local residents pursue a wide variety of life-styles, but many share a common theme, an orientation to the outdoors and natural resources. This is reflected in both vocational and recreational pursuits including employment in agricultural, logging and milling, and mining operations, outfitter and guide businesses, hiking, hunting, fishing, camping and many other recreational activities.

Timber harvest and processing, mining, tourism, and agricultural industries are important to the economy of local areas. Despite the common concern for, and some dependence on natural resources within the local communities, social attitudes vary widely with respect to public land management. Local residents hold a broad spectrum of perspectives and preferences ranging from complete preservation to maximum development and recreational utilization of natural resources.

The key economic factors evaluated in this analysis include population, employment, income, economic diversity and natural resources dependency.

Population

Perhaps the most important attribute of any economy is the community of people who contribute to production, services, trade, and consumption. The five counties in the economic impact area have had different population experiences since the 1970s, where only three of the counties saw overall positive population growth during this 35-year period. All impact area counties did experience median age increases during the last decade.

Economic Impact Area

In aggregate, from 1970 to 2010, the population of these five counties increased by 22,346 people, however this figure obscures the dynamic population experience. The period started with positive growth from the early 1970s through 1976, before starting a 15 year slide until 1990. Afterwards population growth remained positive in all years except 2001 and 2002, translating to an overall average annual increase was 0.5%. In sum, these counties have a year 2010 population of 125,584. There were 8,463 additional residents or roughly 7% growth since 2000. The population in all five counties also got older since 2000, where median ages increased across the board. As a percentage, Jefferson County increased the most, at 13.4% from 40.2 to 45.6. Deerlodge County had the highest median age of 46.2 years old, while Lewis and Clark County had the lowest at 40.7. The 2000 population density in the five-county area was 13 people/square mile (BEA REIS 2005, Table CA30 and US Census 1990 and 2000).

Employment

Changes to access through travel management have the potential to slightly impact the existing configuration of employment across numerous economic sectors that support tourism and recreation in the five counties which is why it is described here. Information available in EPS helps portray the recent employment situation in these counties, which serves as part of the backdrop for travel planning. Providing services employs the greatest portion (6%) of people across the five-county area and the service sector grew rapidly in recent decades in most counties. Government employment was also high (21%) across the economic impact area, whereas goods producing jobs employed only 11%of workers.

Economic Impact Area

In aggregate, over the period 1970 to 2005, growth of 30,594 jobs in the five county area, representing an indexed increase of 169% from 1970 to 2005, was slightly slower than the state (204%) and the nation (191%). This is likely partially a function of the large loss of population during the 1980s. During this 35-year period, the majority of job growth, 63% of new jobs, was in wage and salary positions. For wage and salary jobs, the employment category whose share of the total employment that gained the most was services and professional, which went from 55.8% in 1977 to 64.8% in 2000. In 1970, proprietors represented 13.5% of total employment; by 2005, they represented 23.2% of all jobs (BEA REIS 2005). Farm employment increased slightly between 1977 and 2000, up from 2.9% to 3.3%.

Wage and salary employment (people who work for someone else) contributed 58% of new employment between 1995 and 2005. The growth in the number of operating firms and the available data on jobs by sector for the economic impact area suggest that for wage earners in the services, construction and retail sectors appear to explain much of the remaining job growth in the five county area. In all, during 2005, roughly 5,200 jobs were goods producing jobs, 33,800 were service providing and 13,300 jobs were government jobs. However, in 2005 was government and government enterprises, which accounted for 20% of total employment was down from 25% during 1970 (BEA REIS 2005).

Most firms operating in the five-county area are small in size. During 2000, the size category that had the greatest number of firms was 1-4 employees, the category that grew the most was between 1990 and 2000, had 10-19 employees. In 2005, 89% of firms had fewer than 20 employees. The largest size firms in the five-county area had 500-999 employees (Census County Business Patterns).

In 2011, the unemployment rate was 5.9%, compared to 6.8% in the state. The monthly unemployment varied from a low of 5.3% in October to a high of 6.6% in January (Local Area Unemployment Statistics, Bureau of Labor Statistics). This information for 2011 shows a clear trend of a 1-4% increase in the seasonal unemployment rate between fall and winter months, in every county.

Income

Personal income and per capita income are often used to proxy standard of living. Not surprisingly, Silver Bow and Lewis and Clark Counties, with large populations outpaced more sparsely populated rural counties in total personal income growth during the last 40 years. Jefferson County's rapid increase in population and employment also pushed up total personal income. All counties saw an increase in the portion of income from non-labor sources, which has increased by roughly 10-20% in all five counties, since 1970. Per capita personal income rates have climbed for all counties, with increases ranging from 55 to 122% for the five individual counties and averaging 80% across the economic impact area. Although PCPI for all of the counties was below the national average, this can be explained by the fact that non-metro PCPI is almost always lower than metro PCPI, and this higher income reflects the lower costs associated with living in rural areas versus metro areas which represent a large portion of the national average.

Although average real earnings per job for the five-county area were slightly higher during 2010 than during 1970, they fell through the 1980s and early 1990s before recovering slowly during the late 1990s and early 2000s. At $32,345, average annual wages providing services were lower across the five-county area than average goods producing wages ($48,306) and government wages ($48,055).

Economic Impact Area

From 1970 to 2010, annual total personal income for the economic impact area increased $2.55 billion in real ($2010) terms. The average annual real growth rate of 3.0%, was higher than the state and national rates. The income category whose share of the total gained the most was non-labor income, which went

from 26% in 1970 to 38% in 2010, with even higher percentages than this between the early 1980s and 2005. In those 40 years, non-labor sources grew at an average annual rate of 2.7%, outpacing labor sources which grew at a 1.5% rate. The labor income category whose share of the total shrank the most was manufacturing (including forest products), which went from 10.3% in 1970 to 4.6% in 2010. Of the new income in that period, 44.4% was from non-labor sources. In 2005, 60% of transfer payments were from age-related sources (retirement, disability, insurance payments, and Medicare). That year, welfare represented 7.7% of transfer payments and 1.3% of total personal income. This was up slightly from 1970 and up slightly from 1980 (BEA REIS 2005 Table CA35).

Per capita personal income (PCPI), adjusted for inflation, rose from $20,873 in 1970 to $37,515 in 2010. After this 80% growth during the 40-year period, the 2010 PCPI in the economic impact area ($37515) was higher than the state ($36,160).

Average earnings per job, adjusted for inflation, increased from $39,182 in 1970 to $42,101 in 2010. In 2010, average earnings per job in the economic impact area at $42,101 were higher than the state ($38,690). During the 40-year period, average wage and salary disbursements fell at an average annual rate of -1.1% (adjusted for inflation), whereas average non-farm proprietors' income grew annually by 2.4%. In 2011, mining jobs paid the highest wages at $85,342 and leisure and hospitality jobs paid the lowest at $13,283. The highest number of jobs was trade, transportation and utilities with 9,362 and agriculture, forestry, fishing & hunting jobs had the fewest at 290 jobs. The second highest paying jobs were natural resources at $66,960. The second highest number of jobs was leisure and hospitality at 8,995.

Economic Diversity and Natural Resource Dependency

One measure of economic success and resilience is economic diversity, or the lack of specialization. Some communities that are heavily reliant on only a few industries are economically vulnerable to disruptions. The EPS Economic Diversity Index documents one measure of specialization based on employment data from the 2000 Census. Listed from least to most specialized, Silver Bow County scored 177, Jefferson County scored 264, Lewis and Clark County scored 276, Deerlodge County scored 403, and Powell County scored 421 (versus a median of 961 for all 3, 209 US counties). The main reasons Deerlodge County is more specialized than peer counties is overspecialization in both the healthcare and social service and the accommodation and food services sectors, in addition to under representation of the manufacturing (5.1 compared to 14.1% for the US) and the professional, scientific and technical services. Powell County shares similar economic characteristics and is far more reliant on both the agriculture, forestry, fishing and hunting sector (14.4% compared to 1.5%) and the public administration sector (17.6% compared to 4.8%).

Collectively, these five counties scored 187. In general, the economic impact area is far less reliant on manufacturing (only 4% compared to 14.1%) and more reliant on public administration (13% compared to 4.8%) relative to the US. The economic impact area is slightly more reliant than the US on both the health care and social assistance (13.5% compared to 11.2%) and the accommodation and food services (8.0% compared to 6.1%) sectors.

Wildland dependency data (Gebert and Odell 2006) is based on the percentage of total labor income (employee compensation and proprietor income) earned in five resource areas (timber, mining, grazing, recreation and wildlife, and federal wildland related employment).

Jefferson County was the 9th most wildland dependent county in Montana in 2003, with nearly half (46.8%) of labor income earned in sectors primarily or indirectly supportive of the five resource areas. Jefferson County was also the fourth most mining dependent Montana county that year, even after the percentage of direct dependency on mining had actually decreased by nearly 9% since 1993. Powell County was the next most wildland dependent county of the group during 2003. In that county, timber in

addition to recreation and wildlife comprised the majority of the primary wildland dependence. Mining was Silver Bow County's greatest share of primary dependence during 2003, which was down roughly 2% from 1993. Deerlodge County was the most dependent on Federal Wildland Management (2.2%) of the five counties, during 2003, after mining's share of primary dependence fell from the 1993 level. And although mining was also the highest category of primary wildland dependence (1.5%) for Lewis and Clark County, it was one of the least wildland dependent counties in the state during 2003, after primary dependence on each of the resource categories fell from 1993 levels.

The OHV User Community

The National Survey on Recreation and the Environment (NSRE) research described above estimates recreation occurring statewide on all land ownerships. Another statistically valid recreation study, National Visitor Use Monitoring conducted by the Forest Service estimates participation rates and spending for various activities specifically on the Helena National Forest. The NVUM numbers indicate that during fiscal year 2003, 9.0% of Helena National Forest visitors participated in Off highway vehicle (OHV) recreation, 27.3% participated in driving for pleasure, and 2.6% participated in snowmobiling. These percentages are all smaller than the following activities with the highest participation rates, viewing natural features (48%), viewing wildlife (47.5%), hiking walking/hiking (39.5%), relaxing (36.0%), and hunting (30.1%). When visitors were asked to claim a primary activity, 2.4% claimed OHV use, 1.1% claimed driving for pleasure and 0.9% claimed snowmobiling. In general, spending by all HNF visitors was below the average for visitors to all national forests.

Economics, Environmental Consequences

Introduction

The assessment of economic impacts attempts to identify potential effects that Forest Service travel planning may have on local, county, and regional economic systems. In particular, this analysis is used to address the questions: (1) would changes in the management of the National Forest for recreation and the amount of change in the motorized/non-motorized designation of Forest roads and trails be large enough or imporant enough to cause measurable economic changes? (2) Is the economy of the local area diverse enough and robust enough that the proposed changes will be inconsequential or will they be felt in very specific segments of the local economy?

A short description of each alternative and how it might impact the economy is provided. When looking at potential impacts, the total (direct, indirect and induced) response coefficients for economic impacts associated with any increase or decrease of 1,000 party trips for each activity was considered.

All Forest Service employment and programs generally contribute roughly one to three percent of the jobs and income in the economic impact areas of the Northern Region (Montana and Northern Idaho national forests). The small change in type and quantity of use in the Divide area would likely do little to affect county-level economic indicators (i.e., total employment, total personal income, average annual unemployment rate, wildland dependency) for the five-county area. However, impacts that do occur may be felt strongly by a few vendors and service providers. The 2003 county percentages of economic dependence on recreation and wildlife (ranging from 0-5.5%) may decline slightly in the short-term. This could be considered a normal part of the shifts in economic dependence, typical among highly natural resource dependent counties. Curtailment of motorized activity in multiple locations across the Northern Region could cumulatively have stronger long-term impacts on jobs and income than is expected from each individual travel plan decision alone.

Effects Common to All Action Alternatives

The lands affected by the Divide Travel Management decision are only a small part of the recreation and tourism in these counties (compared with abundant boating, hiking, outfitting, hunting, and fishing opportunities in areas like the Lake Helena, Holter Lake, Canyon Ferry Reservoir, The Big and Little Blackfoot Rivers, The Missouri River, the headwaters of the Clark Fork River, the Jefferson River, the Boulder River, the southern portion of the Bob Marshall Wilderness Complex, the Elkhorns, the Flint Creek Range, Homestake Pass, Great Divide Ski Area, and other nooks of the Divide country). These lands have been increasingly difficult to access due to recent loss of public land access via private lands. The exact economic impacts of travel management decisions would be hard to isolate from other cumulative effects of similar land management and travel planning efforts occurring in this portion of Montana.

Alternative 1, No Action

Since no changes would occur, the current economic contribution is expected to persist into the future under this alternative.

Alternative 2

Alternative 2 is not expected to cause noticeable negative economic impacts, which could occur through reductions below current contributions that motorized recreation make to the economic impact area. However, the few small changes could generate some additional non-motorized opportunities and possibly some new positive economic recreation impacts associated with increased nonmotorized recreation in the impact area resulting from new closures to motorized use.

Alternative 3

Alternative 3 could cause some negative economic impacts, by reducing current contributions that motorized recreation currently make to the economic impact area. On the other hand, there would be some additional non-motorized opportunities and possible new positive economic recreation impacts associated with increased non-motorized recreation in the impact area resulting from new closures to motorized use.

Alternative 4

Effects would be similar to Alternative 3.

Conclusions

Growth trends are largely driven by population growth of both permanent and seasonal residents, and therefore changes in travel management in the Divide area are unlikely to have a noticeable impact on economic indicators for the five-county economic impact area. Even though changes in use attributable to the alternatives outlined in the recreation report are difficult to estimate, even large changes in use would have little effect on the overall economy of the five-county area. Although a few vendors and service providers may be impacted based on site-specific changes to wheeled and snow machine recreation opportunities, substitute recreation and motorized travel opportunities within a short drive would likely moderate the negative impacts to many of these businesses, and travel management changes may promote additional business opportunities in the long term.

Environmental Justice and Civil Rights

None of the alternatives restrict or alter opportunities for subsistence hunting and fishing by Native American tribes. Tribes holding treaty rights for hunting and fishing on the Helena National Forest are included on the project mailing list and have the opportunity to provide comments on this project.

The data suggests that any changes to the miles of roads and trails affected by the decision will have minimal impact on the overall economy of these five counties. Implementation of any of the action alternatives would not likely adversely affect minority or low-income populations.

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U.S. Naval Operations, Energy and Envmtl. Readiness Division

U.S. OEPC

U.S., Northwest Power Planning Council

U.S. Coast Guard

U.S. Federal Aviation Administration

U.S. Federal Highway Administration

U.S. Department of Energy

U.S. Department of Agriculture

U.S. EPA Office of Federal Activities

GLOSSARY AND ACRONYMS

This section contains a glossary, followed by a list of acronyms that are commonly used by the agency and can be found throughout this document.

Glossary

Access	See public access.
Affected Environment	The biological and physical environment that will or may be changed by actions proposed and the relationship of people to that environment.
Alternative	One of several policies, plans, or projects proposed for decisionmaking.
Anadromous Fish	Fish which spend much of their adult life in the ocean, returning to inland waters to spawn; eg., salmon, steelhead.
Aquatic Ecosystem	A stream channel, lake, or estuary bed, the water itself, and the biotic communities that occur therein.
Arterial Road	A NFS road that provides service to large land areas and usually connects with other arterial roads or public highways. These roads are generally maintenance level 4 or 5.
Best Management Practices (BMPs)	The set of standards in the Forest Plan which, when applied during implementation of a project, ensures that water related beneficial uses are protected and that State water quality standards are met. BMPs can take several forms. Some are defined by State regulation or memoranda of understanding between the Forest Service and the States. Others are defined by the Forest interdisciplinary planning team for application Forestwide. Both of these kinds of BMPs are included in the Forest Plan as forestwide standards. A third kind is identified by the interdisciplinary team for application to specific management areas. A fourth kind, project level BMPs, is based on site specific evaluation, and represents the most effective and practicable means of accomplishing the water quality and other goals of the specific evaluation, and represents the most effective and practicable means of accomplishing the water quality and other goals of the specific area involved in the project. These project level BMPs can either supplement or replace the Forest Plan standards for specific projects.
Big Game	Those species of large mammals normally managed as a sport hunting resource.
Big Game Summer Range	Land used by big game during the summer months.
Big Game Winter Range	The area available to and used by big game through the winter season.
Biological Evaluation	An assessment required by the Endangered Species Act of 1973 to identify any threatened, endangered, or sensitive species which is likely to be

	affected by a proposed management action, and to evaluate the potential effects of the proposed action on the species or their habitats.
Capability	The potential of an area of land and/or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, practices such as silviculture, or protection from fires, insects, and disease.
Cavity	A hollow in a tree which is used by birds or mammals for roosting and reproduction.
Closed Roads	Roads developed and operated for limited use. Public vehicular traffic is restricted except when they are operating under a permit or contract or in an emergency.
Closure	The administrative order that does not allow specified uses in designated areas or on Forest development roads or trails.
Designated Route	A National Forest System (NFS) road, a 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). A designation for a road or trail includes all terminal facilities, trailheads, parking lots, and turnouts associated with the designated road or trail. The designation also includes parking within one vehicle width from the edge of the road surface when it is safe to do so.
Developed Recreation	Recreation that occurs where improvements enhance recreation opportunities and accommodate intensive recreation activities in a defined area.
Direct Effects	Effects on the environment which occur at the same time and place as the initial cause or action.
Dispersed Recreation	That portion of outdoor recreation use which occurs outside of developed sites in the unroaded and roaded Forest environment; i.e., hunting, backpacking, and berry picking.
Disturbance	Any management activity that has the potential to accelerate erosion or mass movement; also any other activity that may tend to disrupt the normal movement or habits of a particular wildlife species. At the landscape scale, a disturbance would be a force, such as wildfire, disease, or large scale vegetation management, which can significantly alter existing ecosystem conditions.
Draft Environmental Impact Statement; Draft EIS	Draft Environmental Impact Statement. A detailed written statement as required by Section 102(2)(C) of the National Environmental Policy Act.
Effects (or Impacts)	Physical, biological, social, and economic results (expected or experienced) resulting from natural events or management activities. Effects can be direct, indirect, and/or cumulative.

Endemic	Term applied to populations of potentially injurious plants, animals, or viruses that are at their normal, balanced, level, in an ecosystem in contrast to epidemic levels. Plant and animal diseases which are prevalent in or peculiar to a certain locality.
Elk Hiding Cover	Vegetation, primarily trees, capable of hiding 90 percent of an elk seen from a distance of 200 feet or less.
Elk Security Area	An area elk retreat to for safety when disturbance in their usual range is intensified, such as by logging activities or during the hunting season. To qualify as a security area, there must be at least 250 contiguous acres that are more than 1/2 mile from open roads.
Endangered Species	Any species which is in danger of extinction throughout all or a significant portion of its range, and listed as such by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.
Ephemeral	A depression in the topography that carries surface water during peak rainfall events.
Erosion	The wearing away of the lands's surface by water, wind, ice, or other physical processes. It includes detachment, transport, and deposition of soil or rock fragments.
Essential Habitat	Areas with essentially the same characteristics as critical habitat but not declared as such. These habitats are necessary to meet recovery objectives for endangered, threatened, and proposed species.
Final Environmental Impact Statement (FEIS)	Final Environmental Impact Statement. The final version of the public document required by the National Environmental Policy Act (see Draft Environmental Impact Statement).
Floodplain	Low land and relatively flat areas joining streams, rivers, and lakes which are periodically inundated by overbank flows of water.
Forage	All browse and nonwoody plants available to livestock or wildlife for feed.
Geographic Information System (GIS)	Geographic Information System. A computer program for manipulating landscape configuration data.
Habitat	A place where a plant or animal naturally or normally lives and grows.
Habitat Effectiveness	The measure of how open roads affect utilization of habitat by elk.
Habitat Type	An aggregation of all land areas potentially capable of producing similar plant communities at climax.
Hiding Cover	Trees of sufficient size and density to conceal animals from view at 200 feet. See Cover.
Highway Legal Vehicles	Any motor vehicle that is licensed or certified under state law for general operation on all public roads in the State (FSM 7705). Montana State Law mandates the following regulations for off-highway vehicle (OHV) use on all National Forest Roads: • The OHV must be registered as a motor vehicle at the County

	Treasurers office (a vehicle title is required, a license plate will be issued). • The operator of the vehicle must possess a valid driver's license and a motorcycle/OHV endorsement on their Montana Driver's License. • Operators of these vehicles must be in compliance with all applicable laws. • The vehicle must have a mirror, horn, headlights, and brake lights. A safety helmet is required for anyone under 18 years of age, either a driver or passenger, and is highly recommended for all OHV riders.
Hydrologic Recovery	The process of revegetation of a disturbed area which returns the site to predisturbance levels of water runoff and timing of flow.
Indicator Species	Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish, including those that are socially or economically important. See Management Indicator Species.
Indigenous	Having originated in and being produced, growing, living, or occurring naturally in a particular region or environment.
Indirect Effects	Indirect effects are caused by the action and occur later in time or further removed in distance, but are still reasonably foreseeable.
Interdisciplinary Team (IDT)	Interdisciplinary Team. A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.
Invasive Species	Any non-native plant, which when established are or may become destructive and difficult to control by ordinary means of cultivation or other control practices such as spotted knapweed and yellow star thistle
Inventoried Roadless Area (IRA)	An area which is larger than 5,000 acres, or if smaller than 5,000 acres, contiguous to a designated wilderness or primitive area; meets the minimum criteria for wilderness consideration under the Wilderness Act; and has been inventoried for possible inclusion to the wilderness preservation system
Inventory Data	Recorded measurements, facts, evidence, or observations of forest resources such as soil, water, timber, wildlife, range, geology, minerals, and recreation, which is used to determine the capability and opportunity of the forest to be managed for those resources.
Irretrievable	Foregone or lost production, harvest, or use of renewable natural resources. For example, when fire destroys a tree plantation, the effect is irretrievable but the loss of site productivity as measured by the presence of trees is not irreversible.

Irreversible	The removal of resources such that they cannot be produced gain. This applies most commonly to nonrenewable resources such as minerals or cultural resources, or to resources such as soil productivity that are renewable only over long periods of time. Loss of renewable resources can also be irreversible as in the replacement of a forest with a road.
Landtype; Landtype Association (LTA)	Landtype Association. An area of land classified on the basis of geomorphic attributes. An understanding of geologic processes, as reflected in land surface form and features, individual kinds of soil, and the factors which determine the behavior of ecosystems (i.e., climate, vegetation, relief, parent materials, and time) is used as the basis for this classification system.
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. These roads are usually maintenance level 1 or 2.
Long Term Effects	Those effects which generally occur after the maximum 15 year life of the Forest Plan.
Maintenance Level	Maintenance levels define the level of service provided by, and maintenance required for, a specific road.
Management Area	An aggregation of capability areas which have common management direction and may be noncontiguous in the forest. Consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.
Management Practice	A technique or procedure commonly applied to forest resources, resulting in measurable outputs or activities.
Management Prescription	Management practices and intensities selected and scheduled for application on a specific area to attain multiple use and other goals and objectives.
Mitigation	Avoiding or minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact by preservation and maintenance operations during the life of the action.
Management Direction	A statement of multiple use and other goals and objectives, the associated management prescriptions and the associated standards and guidelines for attaining them.
Management Indicator Species	A plant or animal which, by its presence in a certain location or situation, is believed to indicate the habitat conditions for many other species.
Model	A theoretical projection in detail of a possible system of natural resource relationships. A simulation based on an empirical calculation to set potential or outputs of a proposed action or actions.

Monitoring	An examination, on a sample basis of Forest Plan management practices, to determine how well objectives have been met and a determination of the effects of those management practices on the land and environment.
Motorcycles	All two-wheeled motorized vehicles, including motorcycles and trail cycles. A two-wheeled motor vehicle on which the wheels are situated in a line rather that side by side (FSH 2309.18.05).
National Environmental Policy Act (NEPA)	National Environmental Policy Act. An act to declare a national policy that will encourage productive and enjoyable harmony between man and his environment, to promote efforts that will prevent or eliminate damage to the environment and biosphere, and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality. An interdisciplinary process, mandated by the National Environmental Policy Act, which concentrates decisionmaking around issues, concerns, alternatives, and the affects of alternatives on the environment
National Forest Management Act (NFMA)	A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that require the preparation of Regional and Forest plans and the preparation of regulations to guide that development.
National Forest System (NFS)	All National Forest lands reserved or withdrawn from the public domains of the United States; all National Forest lands acquired through purchase, exchange, donation, or other means; the National Grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012); and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as part of the system.
National Recreation Trails	Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses in or reasonably accessible to urban areas.
National Register of Historic Places	A listing maintained by the National Park Service of areas which have been designated as being of historical value. The Register includes place of local and State significance as well as those of value to the nation as a whole.
Natural Sediment Production	The amount of sediment produced in a watershed prior to any management activities such as roads or harvest. Natural, or baseline, sediment is a function of parent material, soil type, degree of weathering, glacial influences, etc.
No Action Alternative	An alternative where no management activities would occur beyond those currently under way. The development of a No Action Alternative is requested by regulations implementing the National Environmental Policy Act (40 CFR 1502.14). The No Action Alternative provides a baseline for

	estimating the effects of other alternatives.
Off-Highway Vehicle (OHV)	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 (36 CFR 212.1). Includes 4 wheel drive trucks, ATVs, UTVs, and snowmobiles.
Off-Route Exceptions	Under the Clearwater NF Travel Plan, motorized travel off of designated routes would be prohibited for all but over-snow vehicles. The exceptions would include off-route motorized travel in certain areas and under certain conditions for purposes of camping or parking, and it would be permissible to pull off the route to allow other traffic to pass. See Chapter 2, Actions Common to All Action Alternatives, Off-Route Exceptions.
Operator	Any person who is in physical control of a motorbike, all-terrain vehicle, or snowmobile.
Over-snow motorized vehicles	A motor vehicle that is designed for use over snow and that operates on a track or tracks and/or a ski or skis, while in use over snow (36 CFR 212.1).
Perennial Stream	A stream which normally flows throughout the year.
Prescription	Management practices selected and scheduled for application on a designated area to attain specific goals and objectives.
Primitive	Very high probability of experiencing solitude, freedom, closeness to nature, tranquility, self reliance, challenge, and risk. An unmodified and natural environment prevails, with low interaction between users. Restrictions and controls are not evident after entry into the area, and access and travel is non-motorized. There is no evidence of vegetation alteration.
Proposed Action	In terms of the National Environmental Policy Act, the project, activity, or action that a Federal agency intends to implement or undertake and which is the subject of an environmental analysis.
Public Access	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
Range Allotment	A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.
Ranger District	Administrative subdivision of the Forest supervised by a District Ranger.
Record of Decision (ROD)	A document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision about an alternative assessed in the environmental impact statement chosen for implementation.

Recreation Opportunity Spectrum (ROS)	The framework for stratifying and defining classes of outdoor recreation environments, activities, and experiences which are arranged along a continuum or spectrum that is divided into seven classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded modified, roaded natural, rural, and urban.
Recreation Visitor Day	Recreational use of National Forest developed sites or general forest areas which equals 12 visitor hours. A Recreation Visitor Day (RVD) may consist of 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of continuous or intermittent recreation use by individuals or groups. 1 person in a campground for 24 hours equals 2 RVD's.
Right-Of-Way (ROW)	Land authorized to be used or occupied for the construction operation, maintenance, and termination of a project facility passing over, upon, under, or through such land.
Riparian Areas	Areas with distinctive resource values and characteristics that are comprised of aquatic and riparian ecosystems, 100-year floodplains and wetlands. They also include all upland areas within a horizontal distance of approximately 100 feet from the edge of perennial streams or other perennial water bodies.
Road	A motor vehicle route over 50 inches wide, unless identified and managed as a trail (36 CFR 212.1).
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
Road Management	The combination of both traffic and maintenance management operations. Traffic management is the continuous process of analyzing, controlling, and regulating uses to accomplish Natioanl Forest objectives. Maintenance management is the perpetuation of the transportation facility to serve intended management objectives.
Roaded Natural	The opportunity to affiliate with other users in developed sites is available with some chance for privacy. Self-reliance on outdoor skills is only moderately important, and there is little challenge or risk. The area is a mostly natural-appearing environment as viewed from sensitive roads and trails. Interaction between users at campsites is of moderate importance. There are some obvious on-site controls of users, access and travel is conventional motorized including sedans and trailers, recreational vehicles, and some motor homes. Vegetation alterations are done to maintain desired visual and recreation chracteristics.
Roadless Area	An area of National Forest which (1) is larger than 5,000 acres or, if smaller, is contiguous to a designated wilderness area orprimitive area, 92) contains no roads, and (3) has been inventoried by the Forest Service for possible inclusion int he wilderness preservation system.

Roadless Area Review and Evaluation (RARE)	A comprehensive process instituted in June 1977 to identify roadless and undeveloped land areas in the National Forest System and to develop alternatives for both wilderness and other resource management. The second roadless area review and evaluation was conducted on public lands in 1977. This inventory has been updated for this analysis to exclude any area affected by recent development and no longer considered roadless.
Route	A road or trail (FSM 7705).
Security Area	Any area which, because of its geography, topography, and/or vegetation, will hold elk during periods of stress. For this project, a security area is defined as a block of dense forested cover at least 250 acres in size and located at least 1/2 mile from any roads open to motorized traffic during the general hunting season.
Sediment	Any material, carried in suspension by water, which will ultimately settle to the bottom of streams.
Sediment Yield	The amount of material eroded from the land surface by runoff and delivered to a stream system.
Semi-Primitive Non-Motorized	There is a high quality of experiencing solitude, closeness to nature, tranquility, self-reliance, challenge, and risk. It is a natural-appearing environment with low interaction between users. There are a minimum of on-site controls, and access and travel are non-motorized. Vegetation alterations are widely dispersed and not obvious.
Semi-Primitive Motorized	There is a moderate opportunity for solitude, tranquility, and closeness to nature. There is a high degree of self-reliance, challenge, and risk in using motorized equipment. The area is predominantly natural-appearing, and there is a low concentration of users, but often evidence of other users on the trails. Thereare minimum site controls, and restrictions are present but subtle. Vegetation alterations are very small in size and number widely dispersed and not obvious.
Sensitive Species	Species (plants or animals) with special habitat needs that may be influenced by management programs.
Site Productivity	The production capability of specific areas of land.
Snag	A standing dead tree used by birds for nesting, roosting, perching, courting, or foraging for food and by some mammals for escape cover, denning, and reproduction.
Snowmobile	Any self-propelled vehicle under one thousand pounds unladened gross weight, designed primarily for travel on snow or ice or over natural terrain, which may be steered by trcks, skis, or runners.
Soil Productivity	The capacity of a soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.

Stand	A plant community of trees which possess uniformity in vegetation type, age class, vigor, size class, and stocking class and one which is distinguishable from adjacent forest communities.
Standard	An objective requiring a specific level of attainment; a rule to measure against; a guiding principle.
Stream Order	A measure of the position of a perennial stream in the hierarchy of tributaries. First order streams are unbranched streams; they have no tributaries. Second order streams are formed by the confluence of two mor more first order streams. Third order streams are formed by the confluence of two or more second order streams; they are considered third order until they join another third order or larger stream.
Suitable Forest Land	Forest land (as defined in CFR 219.13) for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked (as provided in CFR 219.14), and for which there is management direction that indicates that timber production is an appropriate use of that area.
Supply Limited Stream	A supply (sediment) limited stream has more energy available during a typical year than there is sediment in the stream channel available to be moved. The excess energy leads to a resilience that enables the system to recover and cleanse itself if extreme sediment loads are not delivered in a short period of time.
System Road; Forest System Road	A road that is part of the Forest development transportation system, which includes all existing and planned roads, as well as other special and terminal facilities designated as Forest development transportation facilities.
Temporary Roads	Roads which are constructed for a one time or short term use which are not expected to be utilized in the future. These roads will be obliterated after the need is past.
Terrestrial	Living or growing on land; not aquatic.
Thermal Cover	Cover used by animals to ameliorate effects of weather; for elk, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more.
Threatened Species	Any species that is likely to become an endangered species within the foreseeable future throughout all of a significant portion of its range and one that has been designated as a threatened species in the Federal Register by the Secretary of the Interior.
Trailhead	The parking, signing, and other facilities available at terminus of a trail.
Turbidity	Sediment or foreign particles stirred up or suspended in water.
Unauthorized Routes	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).

	This includes user-created trails.
User-created Routes	Any route currently not managed as a component of the forest transportation system. These include off-road vehicle tracks which have not been designated and managed as a trail, and which may or may not be legal under the 2001 Tri-State Off-Highway Vehicle Decision. They also include travelways abandoned from the forest transportation system, but still exist on the ground and continue to receive use by the public. For this project user-created route, unclassified and unauthorized routes are used interchangeably.
Viewshed	A total landscape as seen from a particular viewpoint.
Visual Quality Objectives (VQOs)	The degree of acceptable alteration of the characteristic landscape.
Visual Resource	The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.
Watershed	The total area above a given point on a stream that contributes water to the flow at that point.
Wilderness Character	Wilderness character attributes are: Natural Integrity, Apparent Naturalness, Outstanding Opportunities for Solitude, and Opportunities for Primitive, Unconfined Recreation. These features were evaluated using capability analyses as conducted in 1978 using the Wilderness Attribute Rating (WAR) System and in 2005 using the Area Capability Assessment (ACA) Process. These analysis techniques rate wilderness character attributes as identified by the 1964 Wilderness Act.

Acronyms

BE	Biological Evaluation
BLM	Bureau of Land Management
BMPs	Best Management Practices
BO	Biological Opinion
CDNST	Continental Divide National Scenic Trail
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
EAU	Elk Analysis Unit
EIS	Environmental Impact Statement
EO	Executive Order

ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FP	Forest Plan
FR	Federal Register
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
FWS	Fish and Wildlife Service
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IDT	Interdisciplinary Team
INFISH	Inland Native Fish Strategy (July 28, 1995)
INFRA	Infrastructure Database (the database of record for Forest Service roads and trails)
IPM	Integrated Pest Management
IRA	Inventoried Roadless Area
LAU	Lynx Analysis Unit
LTA	Landtype Association
MIS	Management Indicator Species
MVUM	Motor Vehicle Use Map
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRLMD	Northern Rockies Lynx Management Direction
OHL	Off-highway Legal
OHV	Off Highway Vehicle
PL	Public Law
RARE	Roadless Area Review and Evaluation
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
SHPO	State Historic Preservation Officer

SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
SWCP	Soil and Water Conservation Practices
TMDL	Total Maximum Daily Load
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
VQOs	Visual Quality Objectives

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APPENDIX A. FORESTWIDE STANDARDS, FOREST PLAN CONSISTENCY, AND MANAGEMENT AREA DIRECTION

This appendix contains two tables. The first table displays the forestwide standards and forest plan consistency as it relates to this project. Appendices referenced in the 'Standard' column on the left refer to the appendices for the Helena National Forest Plan. The second table displays the management area direction for the project.

Table A-1. Forestwide Standards and Forest Plan Consistency

Standard	If Standard applies, how is standard being met
Recreation	
1. New campgrounds and other developed recreation facilities, such as boat ramps or picnic areas, will generally not be constructed. Continue to maintain existing developed sites, but emphasize providing dispersed recreation opportunities. Removal of existing sites may be necessary, in some cases, due to site deterioration or excessive maintenance cost.	This standard is not applicable to the Divide Travel Proposal. The resulting travel decision would not authorize any new developed recreation facilities.
2. Encourage ski-touring trail development by locating and marking additional trails and by encouraging the private sector to develop trails.	This standard is not applicable to the Divide Travel Proposal.
3. Complete a Recreation Opportunity Guide (ROG) for each Ranger District, to make recreation opportunities more visible to the public.	This standard is not applicable to the Divide Travel Proposal.
4. A specific Continental Divide National Scenic Trail (CDNST) route will not be identified prior to approval of the comprehensive plan being prepared by the Forest Service and the Secretary of Agriculture's Advisory Council. Once the comprehensive plan is approved, the management direction will be incorporated further in this plan. Based on the Comprehensive Plan, a more detailed analysis will be completed to show trail segments, objectives and specific route locations. The legislation authorizing the CDNST specifically intended that the trail would not adversely affect or preclude the application of normal management practices on lands adjacent to or within the trail corridor (both public and private). It is not the intent of the legislation that a separate "management plan" be developed for the CDNST, but to provide for the development and management of the trail as a management practice which is integrated into the overall prescription for the land through which the trail passes.	This standard is not applicable to the Divide Travel Proposal. New CDT routes are not proposed under this project. The resulting travel decision would only designate the type of use allowed on the CDT.
5. Emphasize "Pack-In Pack-Out" use in dispersed recreation areas and in wilderness to reduce resource impacts and management costs.	This standard is not applicable to the Divide Travel Proposal.
6. Provide information to users of remote areas and wilderness about potential conflicts with humans and bears and proper camping methods to avoid such conflicts.	This standard is not applicable to the Divide Travel Proposal.
7. Outfitter and guide use will generally be maintained at a level determined from the highest 2 years of actual use experienced during the period l979 through l983. Application for additional or new use will be considered on a case-by-case basis, with	This standard is not applicable to the Divide Travel Proposal.

Standard	If Standard applies, how is standard being met
consideration of resource limitations and public need.	
Visuals	
1. A visual quality objective (VQO) is stated for each management area. These visual quality objectives provide the guidelines for altering the landscape. Portions of each management area may have a more or less restrictive VQO. Appendix B lists roads, trails, campgrounds, etc., that are within sensitive viewing areas. The VQO for these areas is noted in Appendix B. The VQO's for the Continental Divide National Scenic Trail will be the same as the Management Areas through which the trail passes.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize new route construction.
Cultural Resources	
1. The Forest will undertake a systematic program of cultural resource inventory, evaluation, and preservation aimed at the enhancement and protection of significant cultural resource values, as prescribed for Federal Agencies by Section 106 of the National Historic Preservation Act and 36 CFR 800. Cultural resource sites evaluated as significant will be preserved in place whenever possible. When such resources are threatened by project development, an effort to avoid or minimize adverse impact by project redesign will be made. When avoidance is judged by the Forest Supervisor to be imprudent or infeasible, the values of the site will be conserved through proper scientific excavation, recordation, analysis, and reporting. An inventory survey for cultural resources will be made for all significant ground-disturbing activities. Forest inventory efforts will be focused in three areas including: a. Areas where specific project activities, such as timber sales, road developments, range improvements, or mineral development activities, result in significant ground disturbance. b. Large areas where substantial development impact is anticipated, such as oil- and gas-planning areas. c. Areas where formal archaeological surveys may provide management data that are broadly applicable to ecologically similar areas and which will facilitate the development of predictive models capable of addressing issues of cultural site density, distribution, and significance. The Forest will encourage scientific research by privately funded universities as a means of acquiring additional inventory and interpretive data. Such projects will be coordinated with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. Cultural resource site information is exempt from disclosure under the Freedom of Information Act. Following Forest Supervisor written approval, site location data may be released on a need-to-know basis to consultants, universities, or museums. Discovered cultural resources will be evaluated in relation to published Advisory Council on Historic Preservation (ACHP) criteria for eligibility to the National Register of Historic Places. Cultural resource sites determined eligible will be nominated to the National Register. The Forest will coordinate cultural resource issues and concerns with the appropriate Native American groups to ensure that Forest management activities are not detrimental to the protection and preservation of Native American religious and cultural sites, treaty rights, and religious and cultural practices. The Forest will enhance and interpret significant cultural sites for the education and enjoyment of the public when such development will not degrade the cultural property or conflict with other resource considerations. Known significant cultural resource sites on the Forest will be protected from inadvertent or intentional damage or destruction. Portions of the Lewis and Clark	Completed National Historic Preservation Act Section 106 process for the Divide Travel Plan project- inventory, evaluation of significance, evaluation of project effect, State Historic Preservation Office and Tribal consultation. Particular consideration given to cultural resources listed on the National Register of Historic Places. .

Standard	If Standard applies, how is standard being met
National Historic Trail are on the Helena Forest. Some interpretive signing has been placed along the trail. Normal management practices can still access land adjacent to or within the trail corridor, however, project activities will be conducted to minimize disturbance to the cultural site.	
Wildlife and Fish Indicator Species	
1. Populations of wildlife "indicator species" will be monitored to measure the effect of management activities on representative wildlife habitats with the objective of ensuring that viable populations of existing native and desirable non-native plant and animal species are maintained. See Chapter IV, part D Monitoring and Evaluation for specific monitoring requirements. Indicator species have been identified for those species groups whose habitat is most likely to be changed by Forest management activities. The mature tree dependent group indicator species is the marten; the old growth dependent group is represented by the pileated woodpecker and the goshawks; the snag dependent species group is represented by the hairy woodpecker; the threatened and endangered species include grizzly bear, gray wolf, bald eagle and peregrine falcon; commonly hunted indicator species are elk, mule deer and bighorn sheep; fish indicator species is the cutthroat trout.	Habitat has been modeled for many of the MIS for which there are potential effects; the documentation is in the project file. No alternatives propose new road or trail construction: As a result, there is no habitat modification directly associated with the Travel Plan. Indirectly, habitat components in the road corridors—primarily snag and logs—would be removed by firewood cutters. This removal is insufficient to influence local population structure or region-wide viability. For species directly influenced by road density (grizzly bear, elk, mule deer, marten), no alternative increases density, and the 3 action alternatives decrease it. The MIS standard for fish applies. Westslope cutthroat trout habitat has been altered as a function of existing high risk roads and crossings as documented in the fisheries report. Fish habitat will be maintained because this effort results in no ground disturbance activities as a result to administratively open or close roads. Monitoring of fish populations will not occur. Monitoring of fine sediments in streams will be accomplished as part of Forest-wide intra-gravel sediment monitoring using McNeil core samplers (Information included in the Forest Annual Monitoring Report).
Big Game	
Big Game 1. On important summer and winter range, adequate thermal and hiding cover will be maintained to support the habitat potential.	Not applicable: thermal and hiding cover habitat are not affected under any alternative.
2. An environmental analysis for project work will include a cover analysis. The cover analysis should be done on a drainage or elk herd unit basis. (See Montana Cooperative Elk-Logging Study in Appendix C for recommendations and research findings on how to maintain adequate cover during project work.)	A hiding cover analysis was conducted to determine compliance with hiding cover/open road density standard. See *Elk* in *Affected Environment* and *Environmental Consequences.*
3. Subject to hydrologic and other resource constraints, elk summer range will be maintained at 35 percent or greater hiding cover and areas of winter range will be maintained at 25 percent or greater thermal cover in drainages or elk herd units.	Not applicable: thermal and hiding cover are not affected.
4. Implement an aggressive road management program to maintain or improve big game security. To decide which roads, trails, and areas should be restricted and opened, the Forest will use the following guidelines developed with the Montana Department of Fish, Wildlife, and Parks (MDFWP). The Forest visitor map will document the road management program. 4a. Road management will be implemented to at least maintain big game habitat capability and hunting opportunity. To provide for a first week bull elk harvest that does	See Tables in the *Elk* Analysis Section—particularly under *Environmental Consequences*. Only one of 6 elk herd units currently complies with this *Forest Plan* Big Game Security Index. In spite of substantial open road closures in some elk herd units under all 3 action alternatives, compliance/non-compliance with the standard does not change in any case.

<table>
<tr><th>Standard</th><th>If Standard applies, how is standard being met</th></tr>
<tr><td>not exceed 40 percent of the total bull harvest, roads will be managed during the general big game hunting season to maintain open road densities with the following limits.
<table>
<tr><th>Existing Percent Hiding cover (according to FS definition of hiding cover) (1)</th><th>Existing Percent Hiding Cover (according to MDFWP definition of hiding cover) (2)</th><th>Max Open Road Density</th></tr>
<tr><td>56</td><td>80</td><td>2.4 mi/mi (2)</td></tr>
<tr><td>49</td><td>70</td><td>1.9 mi/mi (2)</td></tr>
<tr><td>42</td><td>60</td><td>1.2 mi/mi (2)</td></tr>
<tr><td>35</td><td>50</td><td>0.1 mi/mi (2)</td></tr>
<tr><td>(1) A timber stand which conceals 90 percent or more of a standing elk at 200 feet.</td><td>(2) A stand of coniferous trees having a crown closure of greater than 40 percent.</td><td></td></tr>
</table>
The existing hiding cover to open road density ratio should be determined over a large geographic area, such as a timber sale analysis area, a third order drainage, or an elk herd unit.</td><td></td></tr>
<tr><td>4b. Elk calving grounds and nursery areas will be closed to motorized vehicles during peak use by elk. Calving is usually in late May through mid-June and nursery areas are used in late June through July.</td><td>No new road closures specifically target elk calving areas, but some calving sites will benefit from the closures that focus on productive areas known to be important in multiple ways to big game. MFWP has not indicated a need for new closures to protect elk calving areas. The nature of local wildlife resources is discussed in detail in Local Effects in Key Areas.</td></tr>
<tr><td>4c. All winter range areas will be closed to vehicles between December 1 and May 15. Exceptions (i.e., access through the winter range to facilitate land management or public use activities on other lands) may be granted.</td><td>Roads designated as “crossing routes” through winter range to facilitate access to areas outside winter range will remain stable under all alternatives. A number of existing snowmobile routes intrude into the upper reaches of winter range: These routes do not increase under any alternative. See Environmental Consequences: Elk Winter Range.</td></tr>
<tr><td>4d. At restricted roads, trails, and areas, signs will be posted which tell:
1. Type of restriction.
2. Reason for restriction.
3. Time period of restriction.
4. Cooperating agencies.</td><td>Signing is not a part of this phase of travel planning (which is concerned only with the rationale and decisions to open or close roads).</td></tr>
<tr><td>4e. Roads that will be closed will be signed during construction or reconstruction telling the closure date and the reason for closure.</td><td>Signing is not a part of this phase of travel planning.</td></tr>
<tr><td>4f. Enforcement is a shared responsibility. Enforcement needs will be coordinated with</td><td>The need for enforcement has been discussed with MFWP. The details of enforcement are not part of this phase of travel planning.</td></tr>
</table>

Standard	If Standard applies, how is standard being met
the MDFWP.	
4g. Opened Forest roads will normally have a designed speed of less than 15 miles per hour. Exact design speeds will be determined through project planning. Loop roads are not recommended and will be avoided in most cases.	Alternative 1 preserves existing loop routes. Alternatives 2, 3, and 4 close some loop routes. Speed limit designations are not part of this phase of travel planning.
4h. The Forest Road Management Program will be developed in conjunction with MDFWP and interested groups or individuals. The Road Management Program will contain the specific seasonal and yearlong road, trail, and area restrictions and will be based on the goals and objectives of the management areas in Chapter III of the Forest Plan.	Meetings have been held with MFWP over a period of years during Travel Plan Development. More will be held to discuss specific details of the current proposals. Meeting notes in the project file.
4i. Representatives from the Helena Forest and MDFWP will meet annually to review the existing Travel Plan.	Coordination meetings have taken place for travel planning efforts as well as general program of work. Implementation phase.
5. On elk summer range the minimum size area for hiding cover will be 40 acres and the minimum size area on winter range for thermal cover will be l5 acres.	Not applicable: hiding and thermal cover will not be affected.
6. Montana Cooperative Elk-Logging Study Recommendations, in Appendix C, will be followed during timber sale and road construction projects.	Some of the recommendations are applicable to project implementation, but not this phase of Travel Planning.
7. Inventorying and mapping important big game summer/fall and winter ranges will continue.	Ongoing
8. Any proposed sagebrush reduction programs will be analyzed on a case-by-case basis for the possible impact on big game winter range.	Not applicable: No sagebrush is proposed for removal.
9. Occupied bighorn sheep and mountain goat range will be protected during resource activities. Project plans for livestock, timber, or other resource development will include stipulations to avoid or mitigate impacts on their range. Conflicts between livestock and these wildlife species will be resolved in favor of the big game.	Not applicable: No proposals to affect or modify habitat in occupied bighorn sheep and mountain goat range.
10. Moose habitat will be managed to provide adequate browse species diversity and quantity to support current moose populations.	Not applicable: No habitat will be modified.
Threatened and Endangered (T&E) Species	
1. A biological evaluation will be written for all projects that have potential to impact any T&E species or its habitat. All evaluations will address each projects potential to adversely modify a listed species habitat or behavior. If an adverse impact is determined, mitigation measures will be developed to avoid any adverse modification of a listed species habitat or behavior. If all possible mitigation measures do not result in a no effect determination, then informal and/or formal consultation with the U.S. Fish and Wildlife Service will be initiated.	The analysis of TES species in the Wildlife Specialist's Report serves as the Biological Evaluation for this travel planning effort. A separate Biological Assessment of T&E species will be prepared and submitted to the USFWS for consultation. A biological evaluation will be completed for sensitive westslope cutthroat trout and pearlshell mussels, and a bull trout biological assessment will be prepared and submitted to the USFWS. Because of adverse baseline conditions to listed species habitat (cumulative effects), formal consultation with the U.S., Fish & Wildlife Service via a bull trout biological assessment will be initiated.
2. Grizzly bear -- Apply the guidelines in Appendix D to the Management Situation 1 and 2 (referred to essential and occupied prior to 1984) grizzly bear habitat on the Forest (see	Guidelines in *Forest Plan* Appendix D are for Recovery zones and do not apply to the Travel Plan Area. Guidelines in Appendix E,

Standard	If Standard applies, how is standard being met
map in Appendix D). Initiate field studies in undesignated areas known to be used by grizzlies, to determine if the areas should be designated as grizzly habitat. Until sufficient evidence is available to determine the status of these areas, manage them according to Appendix E, Grizzly Management Guidelines Outside of Recovery Areas.	which do apply to this area, have been used. Discussion is in the Wildlife Specialist's Report under sections on *Grizzly Bear* and in the Biological Assessment.
3. In occupied grizzly habitat, to minimize man-caused mortality the open road density will not exceed the 1980 density of 0.55 miles per square mile, which was determined to have little effect on habitat capability.	The "Grizzly Bear Distribution Zone" is a modified version of "occupied grizzly habitat" outside a Recovery Zone not contemplated by the *Forest Plan.* Unweighted road density in the Distribution Zone is 1.8 mi/mi². There is no *Forest Plan* "occupied habitat" in the Travel Plan Area. See the discussion under *Environmental Consequences: Grizzly Bear.*
4. Research activity on grizzly bears or their habitat will be reviewed by the Research Subcommittee of the Interagency Grizzly Bear Committee.	Not applicable to this effort.
5. Bald Eagle and Peregrine Falcon -- Continue working with the MDFWP, the USFWS, and the BLM to identify nesting and wintering areas. Identify nesting territories and roosting sites, and protect both from adverse habitat alteration. (Guidelines for how to identify bald eagle habitat are in the Wildlife Planning Records.) Powerlines constructed within bald eagle or peregrine falcon habitat will be designed to protect raptors from electrocution. See Appendix D for bald eagle and peregrine falcon habitat maps.	Monitoring of peregrine falcon eyries and bald eagle nests has been ongoing on the HNF since the late 1980s. Both species have been removed from the endangered species list in recent years, and neither is affected in any measurable way by Travel Plan alternatives. See discussion under *Sensitive Species.*
6. Gray Wolf -- With the USFWS and MDFWP, investigate reported gray wolf observations to confirm or deny gray wolf presence. If presence of gray wolf is confirmed, determine if the habitat is necessary for the wolf's recovery. If the habitat is necessary, coordinate with the MDFWP and the USFWS to implement the Wolf Recovery Plan. See Appendix D for gray wolf habitat map.	The wolf is no longer listed as a threatened or an endangered species. Effects on wolves and communications with the USFWS and MFWP are discussed in sections on the *Wolf* under *Sensitive Species.*
7. No known threatened or endangered plants are on the Helena National Forest.	This standard is being met. There are no known threatened or endangered plants on the HNF.
8. Species of Special Concern There are habitats on the Forest where the following species of special concern may be found (Plant Species of Special Concern, USDA-FS, I980) Lemhi penstemon (*Penstemon lemhiensis*), Howell's gumweed (*Grindelia howellii*), Missoula phlox (*Phlox missoulensis*), Cliff toothwort (*Cardamine rupicola*). Missoula phlox and cliff toothwort have been located on the Helena Forest. Other Plants that are termed rare have also been located on the Helena Forest. They are Klaus' bladderpod (*Lesquerella plausii*) and Long-styled thistle (*Cirsium longistylum*). Two additional rare plants, Moschatel (*Adoxa moschalellina*) and Lesser rushy milkvetch (*Astragalus connvallarius*) are believed to occur on the Helena Forest but currently have no occurrence records. If any of these species are verified on the Helena Forest, appropriate measures, pursuant to Section 7 of the Endangered Species Act, will be taken.	If populations have been/are found, they would be protected from ground disturbance or herbicide application. As directed by the Forest Plan, if any of the species of special concern are verified, appropriate measures would be taken.
Old Growth	

Standard	If Standard applies, how is standard being met
An old growth stand is generally characterized by a high level of standing and down, dead and rotting woody material; two or more levels of tree canopies and a high degree of decadence indicated by heart rot, mistletoe, dead or broken tree tops, and moss. Five percent of each third order drainage should be managed for old growth. The priority for old growth acres within each drainage is: first, land below 6000 feet in elevation; second, riparian zones and mesic drainage heads; and third, management areas emphasizing wildlife habitat. These areas will normally be managed on a 240 year rotation and will range from 10 acres to several hundred acres. Management areas other than T-1 through T-5 will be the primary source for old growth. However, if adequate old growth area cannot be achieved then the T management areas will be considered to meet old growth objectives.	These guidelines are not applicable to this travel planning effort.
Snags	
1. To keep an adequate snag resource (standing dead trees) through the planning horizon, snags should be managed at 70 percent of optimum (average of 2 snags/acre) within each third order drainage.	The effects of travel management on dead trees are discussed in detail in sections on *Snags* and MIS and TES species dependent on snags and logs. Since no new roads or trails would be constructed, all effects will be indirect, stemming from the access that open roads give to firewood cuttters and magnified currently by the ongoing bark beetle epidemic.
2. Snag management guidelines need not be applied within a quarter mile of riparian areas, because riparian standards should provide for adequate snags.	See sections addressing *Riparian Habitats* for a discussion of snag management in riparian areas.
3. Larch, ponderosa pine, Douglas-fir, spruce, and subalpine fir, in that priority, are the preferred species for snags and replacement trees (live trees left to replace existing snags).	Not applicable to travel management
4. Management areas other than T-1 should be the primary source for snag management. However, if adequate snags cannot be found outside of T-1, then the following numbers and sizes of snags should be retained in cutting units, if available. A. In units with snags, keep a minimum of 20 snags and 10 replacement trees per 10 acres, if available. If 20 snags are not available, then any combination totaling 30 should be left, by the following dbh classes: 13 snags and 6 replacement trees from 7-11 inches 5 snags and 3 replacement trees from 12-19 inches 2 snags and 1 replacement trees 20+ inches B. In units--except those of pure lodgepole--without snags keep a minimum of 30 wind firm trees per 10 acres, if available, by the following dbh classes: 21 trees from 7-11 inches 7 trees from 12-19 inches 2 trees from 20+ inches If wildlife funds are available, a third of the replacement trees should be girdled or otherwise killed to provide snags, by the following dbh classes: 7 trees from 7-11 inches dbh	See sections on *Snags* for a discussion of how travel management is likely to indirectly affect snag distribution. These guidelines are essentially inapplicable to this travel planning effort.

Standard	If Standard applies, how is standard being met
2 trees from 12-19 inches dbh 1 tree from 20+ inches dbh	
Fisheries	
1. Maintain quality water and habitat for fish by coordinating Forest activities and by direct habitat improvement (see Forest Wide Standards for riparian).	Standard applies. Although current fish habitat conditions have been compromised to various degrees by the current road system, this decision would help maintain habitat by closing up to 52% of high risk roads and 48% of open stream crossings. Through close coordination with fisheries, three high risk fords would be closed to motorized traffic until approved bridge or similar bottomless crossings could be installed.
2. Instream activities should allow for maximum protection of spring and fall spawning habitats.	Standard applies. Several cumulative (present and foreseeable future) actions on roads and existing crossings identified under the roads analysis are designed to improve and stabilize road drainage to minimize risk of sediment delivery into the stream system.
3. Structures installed within streams supporting fisheries will be designed to allow upstream fish movement, especially to spawning areas.	Standard applies. Seven crossing structures west of the Divide are funded for upgrades to replace undersized culverts and allow for aquatic species passage as it relates to cumulative actions. All work within streams is closely coordinated with fisheries and the state to ensure spawning habitats become accessible and are not adversely affected by sediment.
Range	
1. Riparian condition within livestock allotments will be mapped and become part of the Allotment Management Plan.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
2. Where analysis shows range resource damage, the cause will be identified and corrective action will be initiated through an allotment management plan.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
3. Chemical spraying should not be used on sagebrush control projects if other control methods are feasible.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
4. Best Management Practices (BMPs) will be used to minimize livestock damage to lakeside soils, stream sides, and other fragile areas.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
5. Allotment management plans will specify the utilization standards of key plant species needed to protect the soil and water quality. Allowable forage utilization of these plants should be based on local range conditions, soil stability, and known individual plant requirements. The guides for allowable utilization of key species, by condition classes, are in the Range Management Handbook (FSH 2209.21).	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
6. Allotment Management Plans will be developed using the interdisciplinary process.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize

Standard	If Standard applies, how is standard being met
	grazing or allotment management plans.
Noxious Weeds	
1. Implement an integrated weed control program in cooperation with the state of Montana and County Weed Boards to confine present infestations and prevent establishing new areas of noxious weeds. Noxious weeds are listed in the Montana Weed Law and designated by County Weed Boards.	This standard is applicable to project implementation.
2. Integrated Pest Management, which uses chemical, biological, and mechanical methods, will be the principal control method. Spot herbicide treatment of identified weeds will be emphasized. Biological control methods will be considered as they become available.	This standard is applicable to project implementation.
3. Funding for weed control on disturbed sites will be provided by the resource which causes the disturbance.	This standard is applicable to project implementation.
Revegetation	
1. Seeding will be done in a timely manner on disturbed areas, to prevent erosion and to achieve best revegetation results.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any ground disturbance.
2. Seeding mixtures of native plants (naturally occurring) should be used, if practical, in all revegetation projects greater than two acres. On smaller disturbances, the responsible official may authorize the use of exotic species.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any seeding.
3. Seeding guidelines, based on elevation, soil type, parent material, habitat type, and reasonable cost, are listed in Appendix F.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any seeding.
Timber	
1. Silvicultural examinations and prescriptions will be required before any timber manipulation or silvicultural treatment takes place. Exceptions include cutting of trees that block vision along roads, cutting hazard trees, clearing right-of-way, clearing for mineral development, minor and incidental amounts of free use, and cutting personal firewood. Final determination of what silvicultural system will be used for a particular project will be made by a certified silviculturist after an on-the-ground site analysis. This site specific analysis will determine the appropriate even or un-even age silvicultural system that best meets the goals and objectives of the management area. Standards for applying all silvicultural systems, as well as supporting research references are in the Northern Region guide (June 10, 1983). In addition, broad guidelines are found in Appendix H and M. Even aged management methods will be used only where it is determined to be appropriate to meet objectives. Clearcutting will be used only where it is the optimum method.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or manipulating.
2. Tree improvement will be conducted in accordance with the current Regional and Forest level tree improvement plans.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any tree improvements.
3. Transportation plans and logging systems must be designed jointly to provide for long-	This standard is not applicable to the Divide Travel Proposal. The

Standard	If Standard applies, how is standard being met
term stand management, with full consideration given to topography and slope, the overall economic efficiency of roading and yarding costs, and the needs of other resources.	resulting travel plan decision is an administrative action and does not authorize any ground disturbance.
4. Timber stand openings created by even-aged silvicultural systems will normally be 40 acres or less. Creation of larger openings will require a 60-day public review and Regional Forester approval. Exceptions are listed in the Northern Regional Guide.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize changes in timber management.
5. A feasibility analysis of each sale over one million board feet will be made to assure that it has been designed with the most cost-effective measure possible in keeping with environmental concerns. This analysis will examine strategic items in the sale design process to assure consideration of economic impacts of these items on the sale value. A cash flow analysis will be done to determine the viability of the sale with current market conditions. If anticipated costs are higher than predicted high bids, consider the following: a. Defer the sale until economic conditions would indicate receiving higher bids. b. Proceed to sell the timber and provide proper documentation that benefits, other than immediate monetary return from the timber, are of importance.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber sales.
Firewood	
1. The Helena Forest will generally charge a fee for personal use firewood. The Regional Office will annually determine the fee. Designated free firewood areas will continue only as long as demand is less than supply.	This standard is not applicable to the Divide Travel Project proposal. The resulting travel plan decision is an administrative action and does not authorize any fee for personal use firewood.
2. Logging areas will be open to public firewood gathering after the sale is closed and prior to burning logging debris and closing roads, if wood is available and other resource values, such as wildlife snags, downed logs, and soils, can be protected.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any logging activities.
3. Promote a green firewood program where desirable for resource management for both commercial and private firewood gatherers.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or firewood gathering.
4. The public will be informed of firewood gathering opportunities through the local media. Maps and directions to firewood gathering areas will be available at FS offices.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any firewood gathering opportunities.
5. Permits will be required whenever tractors, rubber-tired skidders, jammers, or other yarding equipment normally used by the logging industry are used for yarding firewood.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or logging activities.
6. Providing firewood will be emphasized as a slash treatment method.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or logging activities.
Water, Soil, and Air - Municipal Watershed Guidance	
1. Municipal watersheds will be managed under multiple-use concepts and direction. Management area guidelines will identify permissible land uses, restrictions on land uses, and special measures required to ensure a high quality and quantity municipal water supply. Presently, there are two municipal watersheds on the Forest, Tenmile and	The proposed travel plan is consistent with multiple-use concepts and direction. The proposed travel plan does not specifically address water quality concerns in the Tenmile Creek watershed. The proposed travel plan does not specifically address management actions that might reduce the impact of road sediment

Standard	If Standard applies, how is standard being met
McClellan.	to water quality, as this decision only dictates the open-or-closed status of the routes in the planning area.
2. Design and implementation of projects within the watershed will be guided by FSM 2542.12, as well as specific management area standards and guidelines.	The proposed travel plan does not specifically address management actions that might reduce the impact of road sediment to water quality, as this decision only dictates the open-or-closed status of the routes in the planning area.
3. An environmental analysis will be prepared in coordination with the concerned municipality and the State Water Quality Bureau for each new project proposed within the municipal watershed which could potentially result in degradation of water quality.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional degradation of water quality beyond current levels.
4. Each project implemented in the municipal watersheds will have a designated Forest Service representative responsible for maintenance of water quality within appropriate state standards. Each contractor will designate a representative, who will normally be at the project site, with the authority to take whatever action necessary to remedy any situation which might result in violation of state water quality standards.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional degradation of water quality beyond current levels.
5. Plans and specifications for projects proposed for municipal watersheds will be coordinated with the municipality involved and submitted to the Montana State Department of Health and Environmental Sciences for review and approval as required by Montana Laws regarding public water supply as amended by Chapter No. 556, l979, 75-6-112.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional degradation of water quality beyond current levels.
General Watershed Guidance	
1. Coordination with the State of Montana, as required by the Clean Water Act (33 CFR §208), concerning stream channels and water quality protection.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional degradation of water quality beyond current levels.
2. Watershed improvement projects will be identified, prioritized, and developed on a watershed basis (see Appendix T).	Not applicable
3. A project which causes excessive water pollution, undesirable water yield, soil erosion, or site deterioration will be corrected where feasible, or the project will be re-evaluated or terminated.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional degradation of water quality beyond current levels.
4. Projects involving significant vegetation removal will, prior to including them on implementation schedules, require a watershed cumulative effects feasibility analysis to ensure that water yield or sediment will not increase beyond acceptable limits. The analysis will also identify opportunities, if any exist, for mitigating adverse effects on water-related beneficial uses.	Not applicable—no vegetation removal is authorized in this decision
5. Practices in the Soil and Water Conservation Practices Handbook (FSH 2509.22) developed cooperatively by the State Water Quality Agency and the Forest Service will be incorporated, where appropriate, into all land use and project plans as a principal mechanism for controlling non-point pollution sources and meeting soil, State water quality standards and other resource goals.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional degradation of water quality beyond current levels.
6. Water rights for non-consumptive water uses (instream flows) necessary to maintain fisheries habitat, recreational uses, or other beneficial water uses will be claimed for	Not applicable

Standard	If Standard applies, how is standard being met
appropriate waterbodies and streams.	
7. An environmental analysis, following the process in FSMs 2526 and 2527, will be made for all management actions planned for flood plains, wetlands, riparian areas, or bodies of water prior to implementation. This analysis will determine the short- and long-term adverse impacts and mitigating measures associated with the planned management actions.	This standard does not apply, as the decision does not authorize any new ground-disturbing activities and would not directly result in any additional impact to floodplains, wetlands, riparian areas, or bodies of water beyond current levels.
8. Water transmission lines, dams, and hydro-meteorological data sites will be maintained by the permittee in a safe and serviceable condition. Unsafe or unserviceable facilities will be repaired to approved engineering standards or removed from service.	Not applicable
9. Activities that might affect the validity of data collected at hydro-meteorological data sites will be coordinated with the permittee or cooperating agency before implementation of the project.	Not applicable
10. Applications for hydropower, water diversion, water storage, or other water-related facilities will be evaluated on a case-by-case basis. The applicant may be required to use private consultants or other personnel to make environmental studies needed by the Forest Service and/or state agencies for evaluation of the proposal. Close coordination and cooperation with other agencies where appropriate will be sought.	Not applicable
11. Instream flows adequate to protect the aquatic environment will be maintained during any project which removes water from any stream.	Not applicable
Airshed Guidance	
1. Management activities that affect air quality will comply with Federal and state standards and the Montana Cooperative Smoke Management Plan. (The Plan is part of Fire Planning Records.)	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any type of fire suppression activities.
2. Protect air quality by cooperating with Montana Air Quality Bureau in the Prevention of Significant Deterioration (PSD) program and State Implementation Plan (SIP).	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any fire suppression activities.
Soil Guidance	
1. In accordance with NFMA, RPA, and Multiple Use-Sustained Yield Act, all management activities will be planned to sustain site productivity. During project analysis, ground disturbing activities will be reviewed and needed mitigating actions prescribed.	This standard does not apply to this project because no ground disturbing activities are proposed.
2. Areas of decomposed granite soils will be identified and erosion control measures planned prior to any ground disturbing activities.	This standard does not apply to this project because no ground disturbing activities are proposed.
3. To reduce sedimentation associated with management activities, the highly sensitive granitic soils, which cover about 20 percent of the Forest, will have first priority for soil erosion control.	This standard does not apply to this project because no ground disturbing activities are proposed.
Minerals General	
1. The 1964 Wilderness Act stipulates that effective December 31, 1983, no further mineral entry would be permitted in existing wilderness areas. This includes leasing for oil and gas, applying for patent on existing claims, and staking new claims. However,	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.

Standard	If Standard applies, how is standard being met
citizens' rights to enter public land for prospecting or working valid existing claims is unchanged.	
2. Areas withdrawn from mineral entry should be reevaluated every five years in accordance with Federal Land Policy and Management Act (FLPMA) to determine if the withdrawal is still necessary. (See Appendix Q.)	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize or evaluate mining operations.
3. Access for development of locatable and leasable minerals will be allowed on a case-by-case basis. Access should be directed toward minimizing resource impacts and be coordinated with other land uses.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Locatable Minerals	
1. Consistent with the Mining and Mineral Policy Act of 1970, continue to encourage the responsible development of mineral resources on National Forest lands. Concurrently, require mitigation measures to protect surface resources.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize or evaluate mining operations.
2. Provide guidance to miners and prospectors for planning reclamation and to minimize environmental damage.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not provide any type of guidance on mining operations.
3. Increase I&I efforts through publicizing the appropriate laws, regulations, and policies, to reduce cases of non-compliance from lack of knowledge of mining rules.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
4. Increase compliance inspections commensurate with mineral activities.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not provide guidance or oversight on mining activities.
5. When every reasonable attempt has failed to correct mining operations that are unnecessarily or unreasonably causing or threatening to cause irreparable injury, loss, or damage to surface resources, the Forest Service will seek judicial relief.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not provide oversight on correcting mining operation activities.
6. Maintain a liaison with local mining industry and mining associations. Cooperate with Federal and State agencies which administer mineral laws.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not provide mining administration guidance or oversight.
7. Following mineral development the Forest Service will require reclamation of surface disturbance to prevent or control on- and off-site damage. Reclamation includes, but is not limited to: a. Control of erosion and landslides. b. Control of water runoff. c. Isolation, removal, or control of toxic materials. d. Reshaping and revegetation of disturbed areas. e. Rehabilitation of fisheries and wildlife habitat.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mineral development, or reclamation guidance.
Saleable Minerals	
1. Common variety mineral permits will be considered on a case-by-case basis and will be issued only if consistent with the management area goals.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does

Standard	If Standard applies, how is standard being met
	not authorize mining operations.
Leasable Minerals	
See ROD for Helena National Forest and Elkhorn Mountains Portion of the Deerlodge National Forest Oil and Gas Leasing EIS.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize oil and gas leasing.
Seismic Exploration	
1. An environmental analysis will be completed for each application. A prospecting permit will be issued on a case by case basis and will contain stipulations designed to coordinate surface resource values. The following apply where appropriate: a. Water quality and quantity: Stipulations may be issued to limit activities within 100 feet of all streams, lakes, springs, and ponds. b. Threatened and endangered species habitat: Stipulations will be issued to protect threatened and endangered species by limiting activities during critical periods, and protecting important habitat elements. c. Nongame habitat: Stipulations may be used to limit surface use as a coordination and/or mitigation measure for species listed in State of Montana, Species of Special Interest and Concern. (The State species list is part of the Wildlife Planning Records.) d. Big game habitat: To protect key areas for big game (i.e., winter range, summer concentration habitats, calving areas, lambing areas, big game travel routes, etc.), stipulations may be used during critical periods. e. Archeological and Historic Resources: Proposed seismic survey work which may impact identified cultural and paleontological resources will be required to skip portions of the work or to relocate survey lines around known resource areas. Other resource threatening work will be required to fully comply with the Antiquities Act of 1906 and other related Acts pertaining to cultural resources. f. Special Uses, Leases, and Permits: To protect authorized special uses, leases, and permits, include stipulations to restrict occupancy by timing and location on a case-by-case basis. g. Fire: Seismic work during periods of high fire danger may not be allowed. To prevent wildfire, stipulations may be included to restrict timing and location of seismic operations. Stipulations may also be used to specify procedures and fire fighting equipment required by seismic crews. h. Land Stability and Erosion: Surface occupancy stipulations may be used to prohibit occupancy on lands subject to mass wasting and on slopes 60 percent and greater. i. Recreation: To accommodate concentrated recreational areas (i.e., picnic grounds and campgrounds), stipulations may be used to restrict seismic activities by location and timing.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize seismic exploration.
Land Uses	
1. Approve special use permits only when they comply with the goals of the management area affected. Appendix O provides guidelines for special uses and subdivisions.	Generally this is not applicable to the Divide Travel plan analysis. However, when new applications are received, they will comply with

Standard	If Standard applies, how is standard being met
	goals of affected Management Area and the Guidelines identified in Appendix O.
2. Enhance resource management by working with other agencies and landowners to develop and achieve common resource objectives.	This is not applicable to the Divide Travel plan
3. The Forest will encourage governing entities to proceed with land use planning and zoning prior to subdivision development on lands adjacent to or within the Forest boundary.	This is not applicable to the Divide Travel plan as there are currently no subdivisions proposed in this area.
4. Developers should provide for all necessary services within the limits of the subdivision without infringing on adjacent National Forest lands. But National Forest lands adjacent to subdivisions can be used for services associated with primary access and/or primary utility corridors if these services cannot reasonably be incorporated within the subdivision, or on other adjacent or nearby properties not administered by the Forest Service.	This is not applicable to the Divide Travel Plan analysis for the reasons stated in number 3 above.
5. The Forest Service will attempt to inform non-Federal landowners and land developers adjacent to the Forest of the management direction on the Forest land.	Non-federal landowners within and adjacent to the Forest have been included in the scoping effort of the Divide Travel Plan analysis and will they be kept informed throughout the process.
6. Adjacent private lands will not preclude multiple use management of lands administered by the Forest Service. But management of Forest Service land will be modified where appropriate and necessary to complement land uses on adjacent non-Federal property.	Existing access across the Forest to adjacent non-federal lands will be maintained when there is no reasonable alternative access across other lands through the Divide Travel Plan analysis.
7. When an environmental analysis for a proposed Forest project indicates that activities on adjacent land will require Forest Service management activities to be restricted to protect soil, water, and wildlife resources, the necessary restrictions will be determined. If no activity on Forest land is possible, the desired management will be scheduled for later decades when sufficient recovery has occurred on adjacent lands to permit the proposed activities on Forest Service land to continue. Exceptions to this policy will be considered on a case-by-case basis, when deferring management would result in adverse impacts to other Forest resources.	This is not applicable to the Divide Travel Plan analysis.
Landownership Adjustment	
1. A landownership adjustment schedule for the Helena Forest will be developed using the following criteria: a. The priority for acquisition will be for lands with assessed high wildlife, recreation, and watershed values. Acquisition may entail purchase or donation of fee simple or partial interests, such as conservation and scenic easements, or exchange procedures. b. Emphasize acquisition of land and interests in land to allow access to all Helena National Forest lands. c. Emphasize acquisition of trailhead facilities and trail rights-of-ways, especially to wilderness and dispersed recreation areas. d. Consider disposal of tracts where past patenting has resulted in isolated, intermingled National Forest ownerships, such as at York, Rimini, and Unionville.	The Lands/Rights-of-Way Background Report contains an inventory of rights-of-way interests to pursue, by priority, with the objective being to improve access to Helena National Forest lands.

Standard	If Standard applies, how is standard being met
Administration Facilities	
1. Provide a cost effective program of maintenance to necessary administrative facilities. This will protect the investment, provide for public and employee's health and safety in accordance with current building codes and standards, and present a neat, well kept appearance in harmony with its surroundings.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any maintenance to administrative facilities.
2. Construct new administrative facilities to replace existing structures that are no longer cost effective to maintain or expand or are inadequate to serve the needs of resource management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any construction or expansion of facilities or structures.
Roads	
1. Road construction and reconstruction will be the minimum density, cost, and standard necessary for the intended need, user safety, and resource protection.	1. None of the Alternatives involve road construction or reconstruction
2. Forest development roads will not be constructed without an approved Area Transportation Analysis. Other road construction will be evaluated on a case-by-case basis.	2. None of the Alternatives involve road construction or reconstruction
3. Forest Specialists representing soils, watershed, and fisheries shall identify potential soil erosion, water quality and fisheries problems and provide input to the development of road design standards. Mitigating measures which will be considered in developing these standards include but not limited to: a. Reestablishing vegetation on exposed soils. b. Protecting the road surface through surface stabilization techniques such as dust oil or gravel, especially on decomposed granitic soils. c. Preventing downslope movement of sediment with the use of slash windrows below the fill slopes near stream crossings, baled straw in ditches and catch basins at culvert inlets. d. Reducing soil disturbance in or near streams by diverting clear water around culvert installation sites, especially in important fisheries streams. e. Controlling the concentration of water flow by insloping, outsloping and using minimum grades at stream crossings.	3. No construction or reconstruction would be done as part of any alternative. Maintenance would continue as part of all alternatives. Where roads are closed, appropriate measures would be taken to ensure proper drainage is maintained. In future decisions, the level and type of road decommissioning would be considered.
4. Short term local roads will be used for one time road access needs.	4. No new construction would be done as part of any alternatives
5. Coordinate transportation planning and road management with State and local agencies and owners of intermingled land.	5. The Forest is in the process of obtaining the necessary easements or already has them in place. Obtaining easements is outside the scope of this project.
Road Management	
1. The Helena National Forest will generally be open to vehicles except for roads, trails, or areas which may be restricted. (See Forest Visitor Map for specific information.) The Forest Road Management Program will be used to review, evaluate, and implement the goals and standards of the management areas in the Forest Plan with regard to road, trail, and area wide motorized vehicle use.	1. Alternatives 2, 3 and 4 would increase the miles of road open to over-snow motorized vehicles during the winter months (12/2 – 5/15). These routes are located in areas that are currently open to over-snow motorized use.

Standard	If Standard applies, how is standard being met
2. Road management decisions will be based on user needs, public safety, resource protection, and economics. Most existing roads will be left open. But most new roads will be closed, at least during critical periods for big game. The criteria to be used for road, trail, or area restrictions are as follows: a. Safety - Restrictions may be necessary to provide for safety of Forest users. b. Resource Protection - Unacceptable damage to soils, watershed, fish, wildlife, or historical/archaeological sites will be mitigated by road restrictions or other road management actions as necessary. Restrictions for wildlife reasons will be coordinated with the MDFWP. c. Economics - Restrictions will be considered if maintenance costs exceed benefits. d. Conflicting Use - Conflicts between user groups (especially motorized vs. non-motorized) may require restrictions. e. Facility Protection - Restrictions may be necessary to prevent damage to administrative sites, special use facilities, or other improvements. f. Public Support - Public concern may necessitate restricting or opening some roads, trails, or areas. g. Management Objectives - Road management will be used to achieve land management objectives.	2. a. There would not be any significant changes to user safety. The major changes would involve opening roads up to access by over-snow motorized vehicles. Since these roads are currently closed to other types of motorized use there is would not be any change to safety. (Motorized Mixed use routes for non-street legal vehicles would be evaluated on a case by case basis.) b. There would be a reduction of damage to soils in alternatives 2, 3 and 4 resulting from the additional road closures. c. There would not be any significant changes to economics in any of the alternatives d. Conflicts between user groups would be evaluated on a case by case basis e. Facility Protection - Not applicable f. Public Support-There may be concerns generated by increasing over-snow vehicle access to certain areas. g. Management Objectives-All four alternatives address this issue by continuing to provide strong stewardship of the land while allowing the public to access forest land.
3. The travel restrictions will be reviewed annually and revised as necessary to meet the goals and objectives of the Forest Plan.	3. Travel Restriction will be evaluated annually
4. Enforcement of the Road Management Program will be a high priority. Weekend patrolling, signing, gating, obliterating unnecessary roads, and public education will be used to improve enforcement. Enforcement will be coordinated with the MDFWP and other State and local agencies.	4. Initially increased enforcement activity would be necessary to educate the public regarding the road restrictions for each of the alternatives. Upon completion of this phase of the travel planning effort would result in a Motor Vehicle Use Map (MVUM). Production of a MVUM would occur annually and would assist in educating the public on travel within the Divide Travel Planning Area.
Road Maintenance	
1. Roads will be maintained in accordance with direction provided in FSH 7709.15 (Transportation System Maintenance Handbook) and will be at a level commensurate with the need for the following operational objectives: resource protection, road investment protection, user safety, user comfort, and travel efficiency.	1. Maintenance dollars are dispersed annually based on evaluation and needs. Annual road maintenance funding is limited and is insufficient to cover the entire amount of road maintenance required to a suitable standard. As a result, the Forest maintains roads based on Forest-wide priorities taking areas in need of resource protection into consideration.
2. Assigned maintenance levels will be reviewed annually and revised if management objectives change.	2. Maintenance levels are constantly evaluated for appropriateness.
3. A Forest Road Maintenance Schedule will be prepared annually and be responsive to the long term needs of the Forest Transportation System.	3. The Forest prepares a maintenance schedule annually. Project packets are also prepared in advance in the event additional funding becomes available.

Standard	If Standard applies, how is standard being met
4. Forest specialists representing soils and watershed shall provide input to the road maintenance planning process to verify maintenance standards, identify rehabilitation needs, and designate roads which should be permanently closed for resource protection. Specialists will annually submit capital investment project proposals for major road reconstruction needs.	4. On-going cooperative efforts between Forest resource specialists enables road and trail maintenance standards to be achieved in addition to ensuring resource protection.
Trails	
1. Trail management, such as trail standards, maintenance schedules, funding, trail use, construction, and reconstruction, will follow the guidance in Trails Management Handbook, FSH 2309.18.	This standard is not applicable to the Divide Travel Proposal. The resulting travel decision will not establish new trail standards.
2. Generally, trail maintenance work priorities will be established as follows: a. Priority 1. Activities to correct unsafe conditions relative to management objectives. b. Priority 2. Activities to minimize unacceptable resource and trail damage. c. Priority 3. Activities that restore the trail to planned design standards.	This standard is not applicable to the Divide Travel Proposal.
3. Trail construction/reconstruction will be designed and accomplished to be compatible with the recreation settings and management area goals.	This standard is not applicable to the Divide Travel Proposal.
4. Trails may be abandoned or rerouted when a road changes the character of the trail or when the maintenance cost exceeds the benefit.	This standard is not applicable to the Divide Travel Proposal.
Protection - Insect and Disease	
1. Silvicultural systems will be the primary tool for preventative pest management. Use silvicultural systems to: (1) improve species diversity, growth, and vigor for stands and (2) increase the size diversity and class diversity between stands.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any preventative pest management for silvicultural systems.
2. During ongoing infestations, control insects and disease through silvicultural and biological practices. Chemical controls will be limited to high value areas or used on a broader scale only when all other measures have failed and other resource values can be protected. Emphasize cooperative control measures between Federal, State, and private landowners.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not prescribe any type of insect and disease controls.
3. Biological practices will be considered in controlling insect and disease infestations.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not prescribe any type of insect and disease controls.
4. If possible, harvest stands which are a high risk for mountain pine beetle attack before harvesting moderate or low risk stands.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest.
Protection - Wildfire	
1. The appropriate suppression response(s) is discussed by management area. See Table I in Appendix R, Fire Management, for suppression summaries.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize fire suppression activities.
2. Locate timber sales, or cutting units within a sale, to break-up contiguous natural fuel.	This standard is not applicable to the Divide Travel Proposal. The

Standard	If Standard applies, how is standard being met
	resulting travel plan decision is an administrative action and does not authorize any timber harvest activities.
Protection - Law Enforcement	
1. Law enforcement agreements will be maintained with cooperating counties.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not affect current or future law enforcement agreements and/or cooperative efforts with counties.
2. Each Ranger District should maintain at least one employee qualified in advanced law enforcement (Level III).	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not affect law enforcement personnel positions on the Forest.
3. Across the Forest, two full-range law enforcement positions (Level IV) should be maintained.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not affect law enforcement personnel positions on the Forest.
Prescribed Fire – General	
1. A burning schedule and specific objectives should be completed for each project.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
2. The burning prescription should be plant specific (i.e., burning may set back such species as bitterbrush and Idaho or rough fescue, if done with insufficient soil moisture or when "greening up").	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
3. Prescribed burning should not exceed the natural fire frequency of the Fire Group.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
4. Use prescribed fire only during periods of adequate smoke dispersal and in areas where water quality can be adequately maintained.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
5. The Helena National Forest Soil Survey will be used to assist with individual site selection, to avoid potential soil and/or watershed degradation.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
6. Smoke sensitive areas will be identified and burning prescriptions developed accordingly.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
7. The MDFWP should be invited to participate in selecting treatment sites, executing burning plans, and monitoring and evaluating the overall program.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
Prescribed Fire - Timber	
1. Where timber production is a primary land use, prescribed burning will only be applied where timber production can be maintained or enhanced by burning.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.

Standard	If Standard applies, how is standard being met
2. Prescribed fire, when used as a fuels management or site preparation technique after harvest, should be coordinated with the timber stand's silvicultural prescription.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
Prescribed Fire - Range and Wildlife	
1. Areas that have a demonstrated need to maintain or increase forage because of conifer encroachment, shrub invasion, and imbalance in forb/grass ratios, and/or where grass and shrubs are deteriorating should be recommended for prescribed burning.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
2. Where livestock and wildlife share sagebrush areas, prescribed fire will be designed to produce a mosaic of burned and unburned islands.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
3. Just prior to and following a prescribed burn on grassland, livestock use should be withheld to ensure that adequate fine fuels are available for burning and to prevent overuse of new growth.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any prescribed fire activities.
Riparian	
1. Riparian areas will be delineated prior to implementing any management activities. Riparian areas include: a. Aquatic ecosystems (water, streambed, banks) b. Floodplains c. Riparian ecosystems (area dominated by riparian vegetation) d. One hundred feet from edges of all perennial streams, lakes, and other water bodies, including a, b, and c above.	This decision does not authorize any new ground-disturbing activities and would not directly result in any impacts to riparian areas beyond existing conditions.
2. Discourage concentrated use, such as campsites and roads, in riparian areas. Close wet meadows and wet areas to nonsnow ORVs.	Dispersed campsites along the Little Blackfoot River are in need of modification or relocation, consistent with INFISH standards for recreation management.
3. Identify, prioritize, and develop riparian area rehabilitation projects by watershed.	This decision does not authorize any new ground-disturbing activities. Rehabilitation projects stemming from this decision will be addressed in future NEPA analysis.
4. Roads should not be constructed in the riparian area except to cross them. Use the appropriate soil and water conservation practices to minimize sedimentation during instream construction activities and include them in road construction contracts.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities.
5. Assure that road construction in riparian areas is substantially completed or winterized during winter shut down to minimize peak flow sediment yield during spring thaw.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities.
6. Generally, avoid lateral fills within normal high water marks.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities. Rehabilitation projects stemming from this decision will be addressed in future NEPA analysis.
7. Generally, avoid stream course encroachment and channelization.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities. Rehabilitation projects stemming from this decision will be addressed in future

Standard	If Standard applies, how is standard being met
	NEPA analysis.
8. Use of chemicals within the riparian area will be minimized to the extent feasible, will be coordinated with wildlife, watershed, and fisheries personnel and a certified pesticide applicator.	The resulting travel decision will comply with this standard.
9. Riparian areas will be managed to be compatible with dependent wildlife species.	This standard does not apply to this decision.
10. The timing and type of machinery used in riparian areas should be planned to minimize site damage.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities.
11. Provide vegetative cover adjacent to streams to serve as a filter strip for sediment and maintain optimum water temperatures, as well as provide large debris for long-term instream fish cover and pooling. Where vegetative manipulation is possible, the activities will strive to achieve a balance of age classes and desired species composition.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities.
12. Provide for stream crossing structure design that allows free water flow and fish passage.	This standard does not apply to the decision, as it does not authorize any new ground-disturbing activities.
13. Emphasize off-stream watering in range allotments to prevent damage to the riparian area.	This standard does not apply to this decision.
14. Livestock grazing in riparian areas will be controlled at the following levels of utilization:	The resulting travel decision will comply with this standard.

Vegetative Type	Grazing Systems	Vegetative Condition Class	Forage Utilization by Weight	Browse Utilization by % of Leader Use
Grasslands/ Grass-like/Forb	Continuous	Good	5%	N.A.
		Fair	5%	N.A.
		Poor	20%	N.A.
	Rest-Rotation	Heavy Use Pasture 1/	60%	N.A.
		Light Use Pasture	5%	N.A.
	Defer-Rotation	Heavy Use Pasture	50%	N.A.
		Light Use Pasture	40%	N.A.
Willow/ Grass/ Grasslike	Continous	Good	55%	50%
		Fair	5%	50%
		Poor	5%	50%

Standard					If Standard applies, how is standard being met
and Willow/ Forest	Rest-Rotation	Heavy Use Pasture 2/	70%	50%	
		Light Use Pasture	50%	50%	
	Defer-Rotation	Heavy Use Pasture	60%	50%	
		Light Use Pasture	5	50%	

[1] Trampled areas and streambank damage caused during heavy use year should be healed or stabilized with the following year.
2/ Disturbance on heavy use pasture should be stabilized or healed prior to use the following year.

Table A-2. Management Area Direction and Acres

Management Standards	If Standard applies, how is standard being met
Management Area M-1 (183,500 acres)	
Description: These areas are non-forest and forested land where timber management and range or wildlife habitat improvements are currently uneconomical or environmentally infeasible. The area is scattered throughout the Forest and is found at all elevations and slopes ranging from 10 percent to over 60 percent. The parcels range in size from 20 to 500 acres.	**Management Goal** - Maintain the present condition with minimal investment for resource activities, while protecting the basic soil, water, and wildlife resources.
Recreation - Dispersed recreation can be supported by constructing trails, trailhead facilities, and sanitation facilities.	The resulting travel decision would comply with this standard.
Visual - Because of the lack of activity, the general visual quality objective (VQO) is retention. Less restrictive VQOs may be considered on a case-by-case basis, if project level planning on an adjacent management area affects a M-1 management area. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	The resulting travel decision would comply with this standard.
Wildlife and Fisheries - Management practices to maintain or improve wildlife habitat will be permitted where necessary to meet the objectives of adjacent management areas.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action.
Range - Livestock use may remain at the 1983 level if the area is within existing allotments. Maintain range improvements and build new improvements, if they are needed to facilitate management of adjacent areas.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - Timber harvest, such as salvage and firewood removal, may occur where access exists. Slash created by any management practice will be disposed of in a manner consistent with the management area goals. Forested lands are classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Facilities - Roads will be allowed for special uses, mineral development, or to provide access to other management areas, consistent with protection of soil and water values. Roads may be opened or closed, depending on the objectives of the adjacent management areas. Existing roads and trails will be maintained as needed.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any special use permits, new road or trail construction, improvements, or maintenance.
Minerals – See Forest Plan Amendment #13 for lease standards.	
Protection - Salvage of dead, dying, or high-hazard trees is permitted to prevent disease and insect population build-up. The appropriate fire suppression response ranges from control to confinement depending upon location, expected fire behavior, and other decision criteria related to values at risk. These criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions may be used in this management area, for the enhancement and maintenance of resources. Prescribed fire with unplanned ignitions may be used in this management	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

Management Standards	If Standard applies, how is standard being met
area, for the enhancement and maintenance of resources, when within pre-established prescribed fire criteria. These criteria are stated in the Fire Management Direction in Appendix R. Evaluate areas periodically for significant insect and disease problems. Endemic levels will be accepted as normal. If epidemic levels develop and control is necessary, the control method should minimize impacts on watershed and other resource values.	
Management Area L-1 (78,700 acres)	
Description: These lands are within grazing allotments and are generally non-forested consisting of bunchgrasses, sage and other shrubs or sparsely forested areas with Douglas fir or ponderosa pine as the dominant species. Slopes vary from 10 percent to greater than 60. This management area contains inclusions of elk calving areas, hiding cover, and summer range, but excludes identified elk winter range.	**Management Goals -** Maintain or improve vegetative conditions and livestock forage productivity. Optimize livestock production through intensive grazing systems, while maintaining other resource uses.
Recreation - Motorized and non-motorized dispersed recreation activities are permitted and may be encouraged by constructing or maintaining trails and trailhead facilities. Existing trails and facilities will be maintained, unless they are no longer needed. Controls on motorized recreation will be implemented where necessary to protect the vegetation, soil, water, and wildlife resources and to prevent road damage.	The resulting travel decision would comply with this standard.
Visual - Management practices will generally follow guidelines for the maximum modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the more restrictive VQOs noted in the appendix. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal.
Wildlife and Fisheries - Specific wildlife and fisheries needs will be identified and considered when developing allotment management plans, provided the needs are compatible with area goals. Habitat improvement projects will be scheduled when they would help achieve the area goals.	This standard is not applicable to the Divide Travel Proposal. This travel plan project is an administrative decision to open or close roads and does not authorize any ground disturbance.
Range - Livestock grazing will generally be maintained at or above 1983 levels, unless a range analysis or monitoring indicates there is a need to change. Vacant allotments will be restocked if a range analysis shows it to be feasible and a demand exists for additional AUMs. Intensive management systems will be implemented, where cost-effective, to sustain forage production. Management systems will be designed to minimize conflicts with wildlife. Forage improvement projects such as sagebrush burning, tree encroachment	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.

Management Standards	If Standard applies, how is standard being met
burning, and noxious plant control will be carried out on a scheduled basis. The schedule will be developed as part of the allotment management plans. Improvements, such as cattle guards, fences, and watering facilities, will be maintained and reconstructed as needed to continue present levels of grazing. New improvements may be constructed if the need is identified in an approved allotment management plan.	
Timber - Timber harvest may be used as a tool to improve forage production. However, forested land is classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils – See Forest-Wide Standards.	
Minerals -See Forest Plan Amendment #13 for lease standards.	
Lands – See Forest-Wide Standards.	
Facilities - Roads normally will not be constructed for range management activities, but may be constructed for other activities, such as mining, or to provide access to adjacent management areas. When an existing barrier is intersected, the necessary structures to prevent cattle drift (fences, gates, cattle guards, etc.) will be installed during road construction. - Where existing trails are intersected by new road construction, the trail will be evaluated to determine if it should be retained on the system or abandoned.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection - Use prescribed fire as a tool to increase the quality and quantity of forage. The appropriate fire suppression response ranges from control to confinement depending upon location, expected fire behavior, and other decision logic criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions will be used in this management area, for the enhancement and maintenance of resources. Prescribed fire with unplanned ignitions may be used in this management area, for the enhancement and maintenance of resources, when within pre-established prescribed fire criteria. These criteria are detailed in the Fire Management Direction in Appendix R.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.
Riparian - See Forest-Wide Standards.	
Management Area L2 (15,200 acres)	
Description - This management area is land which is both identified big game winter range and within existing grazing allotments. The land is generally non-forest with bunchgrass, sage and other shrubs or sparsely forested areas of Douglas fir and ponderosa pine. The area is usually at lower elevations in the foothills and has slopes from 10 to 60 percent. The area provides thermal and hiding cover on identified winter range.	**Management Goals -** Maintain or improve range vegetative conditions and forage production for livestock and elk.

Management Standards	If Standard applies, how is standard being met
Recreation - Motorized access will be prohibited or limited to designated routes during wintering periods, generally from December 1 to May 15. Non-motorized dispersed recreation may be supported by constructing trails and trailhead facilities when compatible with area goals.	The resulting travel decision would comply with this standard.
Visual - Management practices will generally follow the guidelines for the modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the more restrictive VQOs noted in the appendix [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied].	This standard is not applicable to the Divide Travel Proposal.
Wildlife and Fisheries - Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, may be used to maintain and/or enhance the quality of big game winter range. Projects will be coordinated for livestock and big game needs. Maintain adequate thermal and hiding cover adjacent to forage areas. Generally this means providing at least 25 percent thermal cover, where available, on identified winter range.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any ground disturbance.
Range - Livestock grazing will be maintained at the 1983 level, however, the level may be increased or decreased if monitoring or range analysis shows a need or opportunity to change. Chemical or mechanical control of invading vegetation should be considered only if needed to improve or maintain forage production. - Forage improvement projects, such as sagebrush burning, tree encroachment burning, and noxious plant control, will be carried out on a scheduled basis. The schedule will be developed as part of the allotment management plans and in coordination with a wildlife biologist. When an existing barrier is intersected by structural improvements, such as cattle guards, fences, and watering facilities, will be maintained or reconstructed as needed to continue present levels of grazing. New improvements will be constructed if the need is identified in an approved allotment management plan.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - Timber harvest may be used as a tool to improve forage production. However, forested land is classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soil – See Forest-Wide standards.	
Minerals - Locatable—To the extent feasible, timing of mineral activities will be coordinated with the needs of wildlife on winter range. This generally will require negotiations during development of operating plans for no surface activity from December 1 to May 15. See Forest Plan Amendment #13 for lease standards.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards.	
Facilities - Roads normally will not be constructed for range or wildlife management activities, but may be constructed for other activities, such as	This standard is not applicable to the Divide Travel Proposal. The resulting

Management Standards	If Standard applies, how is standard being met
mining, or to provide access to adjacent management areas. The necessary structures to prevent cattle drift (fences, gates, cattle guards, etc.) will be installed during road construction.	travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection - Evaluate areas periodically for significant insect and disease problems. Endemic levels will be accepted as normal. If epidemic levels develop and control is necessary, the control method should minimize impacts on big game and other wildlife values. The appropriate fire suppression response ranges from control to confinement depending upon location, expected fire behavior, and other decision logic criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with unplanned ignitions may be used in this management area, for the enhancement and maintenance of resources, when within pre-established prescribed fire criteria. These criteria are detailed in the Fire Management Direction in Appendix R. Prescribed fire may be used as a tool to reduce fuels and increase the productivity of forage for wildlife and livestock.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.
Riparian – See Forest-Wide Standards.	
Management Area H1 (15,100 acres)	
Description - This management area consists of about 75% of the National Forest Land in the Tenmile municipal watershed which lies about 10 air miles southwest of Helena. The entire watershed currently supplies about one half of Helena's domestic water. About 25 percent of this watershed management area is in private ownership, consisting mostly of patented mining claims. Some of these mines are currently active. The town of Rimini also lies within this management area. Vegetative cover varies from dense lodgepole and brush on north and east slopes to open scattered Douglas-fir and ponderosa pine on south and west slopes. This area provides a variety of recreational opportunities as will as habitat for wildlife. This management area contains trail segments that will likely be proposed as part of the Continental Divide National Scenic Trail System.	**Management Goals -** Provide a quantity and quality of water which will, with adequate treatment, result in a satisfactory and safe domestic water supply for the City of Helena. Provide cover and forage for big game animals and necessary habitat components for nongame animals. Provide for dispersed recreation opportunities.
Recreation – Non-motorized dispersed recreation will continue within the drainage; however no additional facilities will be constructed to support the use. Developed recreation facilities will not be constructed.	This standard is not applicable to the Divide Travel Proposal.
Visual – Management practices will generally follow guidelines for the modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the VQOs noted in the appendix. [See Forest Landscape Management Book, vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal.

Management Standards	If Standard applies, how is standard being met
Wildlife and Fisheries – Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance the diversity of wildlife habitat. Maintain adequate thermal and hiding cover adjacent to forage areas as determined by a wildlife biologist. Generally this means providing at least 25 percent thermal cover, on identified winter range.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any improvements or ground disturbance.
Range – The area grazed and the number of AUMs permitted in the watershed will not be increased. However, if livestock grazing decreases the water quality, then the grazing practices will be changed to maintain the water quality.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber – Timber harvest should be implemented only if it can be used as a tool to maintain or enhance watershed and wildlife habitat values. Forested land is classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils – Watershed improvement needs have been inventoried in the Tenmile watershed and priority projects identified. The drainage has the top priority for implementation of watershed improvement projects as funding becomes available. (See Appendix T).	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Minerals – Locatable – To the extent feasible, timing of mineral activities will be coordinated with the needs of wildlife and water quality standards. This generally will require negotiations during development of operating plans for no surface occupancy, from December 1 to May 15 on winter range and during peak runoff. -Leasable - See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – This management area is an avoidance area for utility corridors (see Appendix P).	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any additional, or changes to, utility corridors.
Facilities - Roads will be constructed as needed to meet the management objectives of the area. Minimizing road length, grade and amount of disturbed area will be primary project design criteria. Portions of existing roads that are reconstructed will be maintained at a standard that will prevent unacceptable erosion or will be closed and stabilized. All new roads will be closed and stabilized when projects are terminated.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection – Evaluate areas periodically for significant insect and disease problems. Endemic levels will be accepted as normal. If epidemic levels develop and control is necessary, the control method should minimize impacts on watershed and wildlife values. Use rapid and aggressive fire control methods in this management area. Prescribed fire may be used as a tool to reduce natural fuels and improve quantity and quality of wildlife forage. Fire suppression methods will be selected to minimize or eliminate soil disturbance of the watershed.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

Management Standards	If Standard applies, how is standard being met
Riparian – See Forest-Wide Standards.	
Management Area H2 (4,500 acres)	
Description - This management area consists of about 25% of the Tenmile Municipal watershed with lies about 10 air miles south west of Helena. The entire watershed supplies about one half of Helena's domestic water. This management area contains parcels of productive timber stands of lodgepole pine and Douglas-fir. These parcels are found in Tenmile, Minnehaha, and Walker Creeks on the west side of the watershed and in Beaver and Banner Creek on the east side. This area provides winter and summer habitat for a variety of wildlife species. This management area contains trail segments that will likely be proposed as part of the Continental Divide National Scenic Trail System.	**Management Goals -** Provide a quantity and quality of water which will, with adequate treatment, result in a satisfactory and safe domestic water supply for the City of Helena. Provide cover and forage for big game animals and necessary habitat components for nongame animals. Provide healthy timber stands and optimize growing potential over the planning horizon while protecting the soil and water resources. Provide for dispersed recreation opportunities.
Recreation – Non-motorized dispersed recreation will continue within the drainage, however no additional facilities will be constructed to support the use. Developed recreation facilities will not be constructed. Controls on motorized recreation will be implemented where necessary, to protect the vegetation, soil, and water resources and to prevent road damage.	This standard is not applicable to the Divide Travel Proposal.
Visual – Management practices will generally follow guidelines for the modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the VQOs noted in the appendix. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal.
Wildlife and Fisheries – Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance the diversity of wildlife habitat. Forest-wide Standards and Appendix D contain guidance for T&E species habitat. Maintain adequate thermal and hiding cover adjacent to forage areas as determined by a wildlife biologist. Generally this means providing at least 25 percent thermal cover on identified winter range.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any improvements or ground disturbance.
Range – See Forest-Wide Standards	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - This management area is suitable for timber management activities. Timber harvest practices include clearcuting, group selection, and shelterwood harvest, depending on habitat group, physical site conditions, and silvicultural objectives. Precommercial thinning and intermediate harvest may occur where needed as determined by silvicultural objectives and project planning. (Appendies H and M provide broad guidelines for various habitat groups.)	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.

Management Standards	If Standard applies, how is standard being met
As a minimum, a cutover area will not be considered an opening when: (1) a new forest stand is established and certified as stocked (2) vegetative conditions reach the point where harvest of additional timber can occur and the combined area can still meet watershed management objectives. Prescribed burning or other techniques may be used for slash disposal, site preparation, and silvicultural objectives. In habitat groups where fire is not a useful treatment tool, lopping and scattering, yarding unmerchantable material (YUM), or other methods will be used to reduce fuel accumulations and prepare sites for regeneration. Project level planning will provide for stand regeneration within five years of final harvest. Even-aged stands will be scheduled for final regeneration harvest when they generally have reached the culmination of mean annual increment (CMAI) of growth. Exceptions include thinning or other stand improvement measures, salvage or sanitation harvest, management for experimental or research purposes and to meet other resource objectives. CMAI for primary species on the Helena National Forest is shown in Appendix H.	
Water and Soils – Watershed improvement needs have been inventoried in the Tenmile watershed and priority projects identified. The drainage has the top priority for implementation of watershed improvement projects as funding becomes available (See Appendix T). Timber harvest will not create runoff increases which are likely to result in stream channel degradation. All timber sale proposals will include an analysis of current conditions and potential sediment production. The project proposal will analyze and evaluate the potential water quantity and quality, and soil productivity impacts; mitigation measures will be developed to minimize adverse effects. If a proposal shows the water quality can not be maintained, within State standards for A-1 watersheds and public water supplies the project will be redesigned to meet the standards or terminated. Water quality monitoring will be an integral part of all timber harvest proposals.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Minerals – Locatable – To the extent feasible, timing of mineral activities will be coordinated with the needs of wildlife and water quality standards. This generally will require negotiations during development of operating plans for no surface occupance, from December 1 to May 15 on winter range and during peak runoff. All minerals operations will be closely monitored to insure that water quality standards are maintained. - Leasable See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – This management area is an avoidance area for utility corridors.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any additional, or changes to, utility corridors.
Facilities – Portions of existing roads that are reconstructed will be maintained at a standard that will prevent unacceptable erosion or will be closed and stabilized.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.

Management Standards	If Standard applies, how is standard being met
Roads will be constructed as needed to meet the management objectives of the area. Minimizing road width, grade and amount of disturbed area will be primary project design criteria. All new roads will be closed and stabilized when projects are terminated to minimize erosion. Where existing trails or non-system roads are intersected by new road construction, the trail or non-system road will be evaluated to determine if it should be retained on the system or abandoned.	
Protection Insect and disease control should emphasize reduction and prevention through timber harvest and timber stand improvement. The use of other approved pest management techniques consistent with municipal watershed goals may be necessary at times. Use rapid and aggressive fire control methods in this management area. Prescribed fire may be used as a tool to reduce natural fuels and improve quantity and quality of wildlife forage. Fire suppression methods will be selected to minimize or eliminate soil disturbance of the watershed.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.
Riparian – Timber harvest will be on a 240 year rotation and harvest types will generally be selection or group selection.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Management Area R1 (34,300 acres)	
Description - This management area consists of large blocks – greater than 3,000 acres—of undeveloped land suited for dispersed recreation. These lands include Mount Helena, Trout Creek Canyon, Indian Meadows, Nevada Mountain, Camas Lakes, and Silver King/Falls Creek. The Silver King/Falls Creek area has been identified by the USGS as having a high potential for oil and gas. These areas provide opportunities for semi-primitive non-motorized recreation and are characterized predominately by natural or natural appearing environment where there is a high probability of isolation from man's activities.	**Management Goals -** Provide a variety of semi-primitive and primitive nonmotorized recreation opportunities. Provide for maintenance and/or enhancement of fishery, big game, and nongame habitat, grazing allotments, visual quality, and water quality.
Recreation Motorized vehicles are not allowed in the management area. Exceptions may be allowed on a case-by-case basis where motorized vehicles are needed for legitimate mineral use. -Recreation facilities will be permitted to preserve or enhance dispersed recreation opportunities. Portals, shelters, toilets, trail signs, etc., may be constructed if a need is identified. Existing facilities may be maintained or reconstructed as needed to expand dispersed recreation opportunities. -Developed campgrounds will not be constructed in this area.	The resulting travel decision would comply with this standard.
Visual - Management practices will follow the guidelines for the retention VQO. Short term deviations may occur during construction or reconstruction of facilities or from management activities. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk, No. 462) for definitions of VQOs and how they are	This standard is not applicable to the Divide Travel Proposal.

Management Standards	If Standard applies, how is standard being met
applied.]	
Wildlife and Fisheries – Habitat improvement projects, such as prescribed fire and water developments, may be used to maintain or improve the fish and wildlife habitat, if the projects are compatible with the area's goals.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any improvements or ground disturbance.
Range - Livestock grazing will be maintained at the 1983 levels within existing allotments, however, the level may be increased or decreased if monitoring or range analysis shows a need or opportunity to change. Range improvements, such as salting, water developments, etc., may be implemented to disperse livestock use.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - Forested lands are classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils – See Forest-Wide Standard.	
Minerals – Locatable – Maintain an unroaded environment to the extent practical under the mining laws and the Mining Act Use Regulations. Use of motorized vehicles and timing of mineral activities will be coordinated with dispersed recreation and wildlife needs during development of the operating plan. Leasable See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – This management area is an avoidance area for utility corridors (see Appendix P).	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any additional, or changes to, utility corridors.
Facilities – Roads will not be constructed for surface management purposes unless absolutely necessary for mineral activity or to access private land. -Trailhead facilities may be constructed to increase accessibility and enhance recreation opportunities.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection - Evaluate areas periodically for significant insect and disease problems. Endemic levels will be accepted as normal. If epidemic levels develop and control is necessary, the control method should minimize impacts on the dispersed recreation values. Wildfire suppression should minimize the use of heavy equipment. The appropriate fire suppression response ranges from control to confinement depending upon location, expected fire behavior, and other decision criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions may be used in this management area, for the enhancement and maintenance of resources. Prescribed fire with unplanned ignitions may be used in this management area, for the enhancement and maintenance of resources, when within pre-established prescribed fire criteria. These criteria are detailed in the Fire Management Direction in Appendix R.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.
Riparian – See Forest Wide Standards	

Management Standards	If Standard applies, how is standard being met
Management Area T1 (156,000 acres)	
Description - This management area consists of lands available and suitable for timber management with varying physical and biological environments as determined by soil, slope, aspect, elevation, and climatic factors. Vegetation varies from ponderosa pine on the drier sites to spruce in the more mesic sites with nearly all slopes and aspects represented. Although this area consists primarily of suitable forest land, there are inclusions of nonforest and nonproductive forest lands. This area includes some small ponds and marshes which are considered unique to this part of Montana.	**Management Goals -** Provide healthy timber stands and optimize timber growing potential over the planning horizon. Emphasize cost-effective timber production, while protecting the soil productivity. Maintain water quality and stream bank stability. Provide for dispersed recreation opportunities, wildlife habitat, and livestock use, when consistent with the timber management goals.
Recreation - Motorized and non-motorized dispersed recreation activities are permitted and may be supported by constructing or maintaining trails and trailhead facilities. Existing trails and facilities will be maintained unless they are no longer needed. - Controls on motorized recreation will be implemented where necessary, to protect the vegetation, soil, and water resources and to prevent road damage.	The resulting travel decision would comply with this standard.
Visual - Management practices will generally follow guidelines for the maximum modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet more restrictive VQOs noted in the appendix. [See Forest Management Book, Vol. 2 (Ag. Hdbk, No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal
Wildlife and Fisheries - Wildlife and fisheries habitat improvement projects may be implemented, provided they are compatible with the management area goals. Forest-Wide Standards and Appendix D contain guidance for T&E species habitat.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new projects.
Range - Livestock grazing is compatible, except where it conflicts with stand establishment. Fencing, temporary herding, or other techniques may be used to protect regeneration where needed. Pasture and allotment boundaries should be maintained during and following timber harvest. This may require additional fencing, where natural barriers are breached by timber sale activities. Livestock grazing will be maintained at the 1983 levels within existing allotments, however, the level may be increased or decreased if monitoring or range analysis shows a need or opportunity to change.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - This management area is suitable for timber management activities. Timber harvest practices include clearcut, group selection, and shelterwood harvest, depending on habitat group, physical site conditions, and silvicultural objectives. Precommercial thinning and intermediate harvest may occur where needed as determined by silvicultural objectives and project planning.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.

Management Standards	If Standard applies, how is standard being met
(Appendices H and M provide broad guidelines for various habitat groups.) As a minimum, a cutover area will not be considered an opening when: (1) a new forest stand is established and certified as stocked, and (2) vegetative conditions reach the point where harvest of additional timber can occur and the combined area can still meet watershed management objectives. Prescribed burning or other techniques may be used for slash disposal, site preparation, silvicultural, and livestock objectives. In habitat groups where fire is not a useful treatment tool, lopping and scattering, yarding unmerchantable material (YUM), or other methods will be used to reduce fuel accumulations and prepare sites for regeneration. Project level planning will provide for stand regeneration within five years of final harvest. Even-aged stands will be scheduled for final regeneration harvest when they generally have reached the culmination of mean annual increment (CMAI) of growth. Exceptions include thinning or other stand improvement measures, salvage or sanitation harvest, management for experimental or research purposes and to meet other resource objectives. CMAI for primary species on the Helena National Forest is shown in Appendix H.	
Water and Soils Timber harvest will not create runoff increases which are likely to result in long term stream channel degradation. All timber sale proposals will include an analysis of the current and projected status of sediment produced. The project proposal will analyze and evaluate the potential water quantity and quality, and soil productivity impacts; mitigation measures should be developed to minimize adverse effects. If a proposal shows the water quality can not be maintained, the project will be reevaluated or terminated.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Minerals – Locatable – See Forest-Wide Standards. Leasable See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards	
Facilities - Roads will be constructed as needed to meet the management objectives of the area. Where existing trails are intersected by new road construction, the trail will be evaluated to determine if it should be retained on the system or abandoned.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection Insect and disease control should emphasize reduction and prevention through timber harvest and timber stand improvement. The use of other approved integrated pest management techniques may be necessary at times. The appropriate fire suppression response ranges from control to containment depending upon location, expected fire behavior, and other decision logic criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions may be used in this management area,	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

Management Standards	If Standard applies, how is standard being met
for the enhancement and maintenance of resources. Fuel reduction methods for activity created fuels include burning, removing residue, or rearranging, such as dozer trampling.	
Riparian - Generally, harvesting will only occur in riparian areas in conjunction with sale activity on adjacent lands. In riparian areas, any timber harvest should be on a 240 year rotation, and harvest types should be selection or group selection. See Forest Wide Standards for grazing in riparian. The small ponds and marshes in Section 15, 16, 21, and 22 of T8N, R6W PMM are unique to this part of Montana and will be protected in project design and implementation.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Management Area T3 (37,700 acres)	
Description - This management area consists of lands that have primary forage, resting, and security characteristics that provide important spring and summer requirements for all big game species. These lands also supply the habitat needs of a wide variety of nongame forest dwelling wildlife. In addition lands within this management area contain productive timber sites that are available and suitable for timber management. The variation in elevation, topography, slope, and aspect, in addition to the often abundant surface water (seeps, springs, etc.), make these areas rich in species diversity and total numbers within species groups. This area also has inclusions of small grassland parks.	**Management Goals -** Maintain and/or enhance habitat characteristics favored by elk and other big game species. Provide for healthy timber stands and a timber harvest program compatible with wildlife habitat goals for this area. Emphasize cost-effective timber production, while protecting the soil productivity. Maintain water quality and stream bank stability. Provide for other resource objectives where compatible with the big game summer range and timber goals.
Recreation - Controls over motorized dispersed recreation will be implemented where necessary to protect wildlife habitat values. Nonmotorized dispersed recreation may be supported by constructing trails and trailhead facilities when compatible with management area goals.	The resulting travel decision would comply with this standard.
Visual - Management practices will generally follow guidelines for the modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the more restrictive VQOs noted in the appendix. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal
Wildlife and Fisheries - Maintain a minimum of 35 percent hiding cover for big game. Maintain thermal cover adjacent to forage areas. Appendix C provides guidance for thermal cover. Wildlife habitat improvement practices, including road management, prescribed fire, and timber harvest, may be used to maintain and/or enhance the quality of big game summer habitat.	This standard is not applicable to the Divide Travel proposal. Thermal and hiding cover are not affected.
Range - Livestock grazing will be maintained at the 1983 levels within existing	This standard is not applicable to this project. The resulting travel plan decision

Management Standards	If Standard applies, how is standard being met
allotments, however, the level may be increased or decreased if monitoring or range analysis show a need or opportunity to change. Grazing systems will be designed to be compatible with wildlife needs. Improvements for livestock management, such as fencing and water developments, will be implemented unless they are a detriment to big game.	is an administrative action and does not authorize grazing or allotment management plans.
Timber - This management area is suitable for timber management activities. Timber harvest methods and volumes may be modified as necessary to achieve the management area goals. Even-aged stands will be scheduled for final regeneration harvest when they generally have reached the culmination of mean annual increment (CMAI) of growth. Exceptions include salvage or sanitation harvest and management for experimental or research purposes and to meet other resource objectives. CMAI for primary species on the Helena National Forest is shown in Appendix H. Appendix M provides guidance for various vegetative management practices by habitat group. Stocking control may be maintained through pre-commercial and commercial thinning. The timing and planning of thinning operations will be coordinated with a wildlife biologist. Vegetative diversity will be encouraged. Openings created by timber harvest will be reforested to the extent necessary to meet the hiding cover requirements of big game before harvesting adjacent areas.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils - Timber harvest will not create runoff increases which are likely to result in long term channel degradation. All timber sale proposals will include an analysis of the current and projected status of sediment produced. The project proposal will analyze and evaluate the potential water quantity and quality and soil productivity impacts; mitigation measures should be developed to minimize adverse effects. If a project proposal shows the water quality can not be maintained, the project will be reevaluated or terminated.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Minerals - Locatable—To the extent feasible, timing of activities will be coordinated with the needs of wildlife on summer range. This will require negotiations during development of operating plans for minimum disturbance to wildlife. Leasable ---- See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards	
Facilities - Roads will be constructed as needed to meet the management area goals. Where existing trails are intersected by new road construction, the trail will be evaluated to determine if it should be retained on the system or abandoned.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection - Insect and disease control should emphasize reduction and prevention through timber harvest and timber stand improvement. The use of other approved integrated pest management techniques may be necessary at times. The appropriate fire suppression response ranges from control to containment	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

Management Standards	If Standard applies, how is standard being met
depending upon location, expected fire behavior, and other decision criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions may be used in this management area, for the enhancement and maintenance of resources. Fuel reduction methods for activity created fuels include burning, removing residue, or rearranging, such as dozer trampling. Disposal activities will meet visual quality objectives.	
Riparian - See Forest Wide Standards for grazing in riparian. Generally, harvesting will only occur in riparian areas if in conjunction with sale activity on adjacent lands. In riparian areas, any timber harvest should be on a 240 year rotation and harvest types should be selection or group selection.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Management Area T4 (10,100 acres)	
Description - This management area is productive timberland within the sensitive viewing area of many major travel routes, use areas, and water bodies. Vegetation varies from ponderosa pine, on the drier sites, to spruce in the moistest areas. Nearly all slopes and aspects are represented. Most of the area is suitable forest land, but there are some inclusions of nonforest and nonproductive forest land.	**Management Goals -** Maintain healthy stands of timber within the visual quality objective of retention and partial retention. Provide for other resource uses as long as they are compatible with visual quality objectives. Emphasize cost-effective timber production, while protecting the soil productivity. Maintain water quality and stream bank stability.
Recreation – Motorized and non-motorized dispersed recreation activities are permitted and may be supported by constructing or maintaining trails and trailhead facilities. Controls over motorized recreation will be implemented where necessary to protect resource values such as vegetation, soil, water, and VQOs.	The resulting travel decision would comply with this standard.
Visual – Management practices will generally follow guidelines for partial retention and retention depending upon the particular portion of the management area being entered. (Refer to Appendix B, Sensitive Viewing Areas, for most heavily used roads and recreation areas.) Departures from these VQOs will be considered on a case-by-case basis after an environmental analysis has been completed. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal.
Wildlife and Fisheries – Where elk habitat exists, project design will incorporate management practices to maintain or enhance summer and winter habitat to the extent that the VQOs for the area are met. -Wildlife and fisheries habitat improvement projects may be implemented, provided they are compatible with the management area goals.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any type of improvements for fish and wildlife.
Range – Pasture and allotment boundaries should be maintained during and following timber harvest. This may require additional fencing where natural	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment

Management Standards	If Standard applies, how is standard being met
barriers are breached by timber sale activities. Livestock grazing will be maintained at the 1983 levels within existing allotments, however, the level may be increased or decreased if monitoring or range analysis show a need or opportunity to change.	management plans.
Timber - This management area is suitable for timber management activities. Even-aged stands may be scheduled for final regeneration harvest when they generally have reached the culmination of mean annual increment (CMAI) of growth. Exceptions include thinning or other stand improvement measures, salvage or sanitation harvest, and management for experimental or research purposes and to meet other resource objectives. CMAI for primary species on the Helena National Forest is shown in Appendix H. Timber harvest practices include clearcutting, group selection, and shelterwood harvest, depending on habitat group, physical site conditions, and visual quality objectives. Precommercial thinnings and intermediate harvest will occur where needed as determined by silvicultural objectives, project planning, and visual quality objective. (Appendies H and M provide broad guidelines for various habitat groups.) Openings created by timber harvest will be reforested to the point where harvest of adjacent timber can occur and the combined area can still meet the VQOs of the area. Use timber harvest to rehabilitate existing harvest units, to improve the VQO. Prescribed burning will be used to accomplish slash disposal, site preparation, and silvicultural objectives. In habitat groups where fire is not a useful treatment tool, loping and scattering, YUM yarding, or other methods will be used to reduce fuel accumulations and prepare sites for regeneration provided the area goals are met.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils - Timber harvest will not create runoff increases which are likely to result in long term channel degradation. All timber sale proposals will include an analysis of the current and projected status of sediment produced. The project proposal will analyze and evaluate the potential water quantity and quality and soil productivity impacts; mitigation measures should be developed to minimize adverse effects. If a project proposal shows the water quality can not be maintained, the project will be reevaluated or terminated.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Minerals - Locatable—Plans of operation will include measures to maintain the VQO of the area. Leasable ---- See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards.	
Facilities - Roads will be constructed as needed to meet the management objectives of the area.. Where existing trails are intersected by new road construction, the trail will be evaluated to determine if it should be retained on the system or abandoned.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new construction or improvements.
Protection - Insect and disease control should emphasize reduction and prevention through timber harvest and timber stand improvement. The use of other approved integrated pest management techniques may be necessary at	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

Management Standards	If Standard applies, how is standard being met
times. Aggressive control will normally be the appropriate fire suppression response in this management area. Prescribed fire with planned ignitions will be used in this management area, for the enhancement and maintenance of resources. Fuel reduction methods for activity created fuels include burning, removing residue, or rearranging, such as dozer trampling. Disposal activities will meet visual quality objectives. Wildfires will be suppressed in a manner that minimizes the use of heavy equipment.	
Riparian - See Forest Wide Standards for grazing in riparian. Generally, harvesting will only occur in riparian areas if in conjunction with large sale activity on adjacent lands. In riparian areas, any timber harvest should be on a 240 year rotation and harvest types should be selection or group selection.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Management Area T5 (40,300 acres)	
Description - This management area consists of suitable timber stands interspersed with natural openings, generally with existing livestock allotments. Forage is provided by natural meadows and transitory range. The area consists of mostly Douglas-fir, with some lodgepole pine. It encompasses lower elevations and dry sites on the Forest usually on the fringes of native grasslands.	**Management Goals -** Increase production and quality of forage. Manage timber sites cost-effectively, by selecting the most economical harvest system and managing for natural regeneration. Provide for healthy stands of timber and timber products consistent with increasing quality and quantity of forage. Emphasize cost-effective timber production, while protecting the soil productivity. Maintain water quality and stream bank stability. Provide for other resource uses that are compatible with the other goals.
Recreation – Motorized and non-motorized dispersed recreation activities are permitted and may be supported by constructing or maintaining trails and trailhead facilities. Existing trails and facilities will be maintained unless they are no longer needed. Controls over motorized recreation will be implemented where necessary to protect the vegetation, soil, water, and wildlife resources and to prevent road damage.	The resulting travel decision would comply with this standard.
Visual – Management practices will generally follow guidelines for the modification VQO. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the more restrictive VQOs noted in the appendix. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 461) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal

Management Standards	If Standard applies, how is standard being met
Wildlife and Fisheries –Wildlife and fisheries habitat improvement projects may be implemented, provided they are compatible with the management area goals. Maintain adequate thermal and hiding cover adjacent to forage areas, provided timber harvest volumes are not significantly reduced over the rotation period.	This standard is not applicable to the Divide Travel Proposal. The travel plan project is an administrative decision to close or open existing roads and does not authorize other actions related to other resources.
Range – Livestock grazing will generally be maintained at or above 1983 levels, unless a range analysis indicates there is a need to change. Vacant allotments will be restocked if a range analysis shows it to be feasible and a demand exists. Transitory range resulting from timber harvest will be intergrated into the allotment planning process. Intensive management systems will be implemented, where cost-effective, to develop the range resource for sustained forage production. Management systems will be designed to minimize conflicts with wildlife. Forage improvement projects such as sagebrush burning, tree encroachment burning, and noxious plant control may be carried out on a scheduled basis. The schedule will be developed as part of allotment plans. Existing structural improvements, such as cattle guards, fences, and watering facilities, will be maintained or reconstructed as needed to continue present levels of grazing. Additional improvements may be built if the need is identified in an approved allotment management plan.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - This management area is suitable for timber management. Timber harvest methods include clearcutting, group selection, and shelterwood harvest, but may be modified to favor forage production. Clearcuts will be designed to ensure natural regeneration. Appendix M provides guidance for various vegetative management practices in the habitat groups on the Forest. Regeneration will be by natural means and will occur within 5 years of final harvest. As a minimum, a cutover area will not be considered an opening when: (1) a new forest stand is established and certified as stocked, and (2) vegetative conditions reach the point where harvest of additional timber can occur and the combined area can still meet watershed management objectives. Final entry of a shelterwood harvest may be delayed up to four decades to provide transitory range and to ensure regeneration. Animal control may be required on a case by case basis to ensure regeneration within 5 years of final harvest.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils - Timber harvest will not create runoff increases which are likely to result in long term channel degradation. All timber sale proposals will include an analysis of the current and projected status of sediment produced. The project proposal will analyze and evaluate the potential water quantity and quality and soil productivity impacts; mitigation measures should be	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.

Management Standards	If Standard applies, how is standard being met
developed to minimize adverse effects. If a project proposal shows the water quality can not be maintained, the project will be reevaluated or terminated.	
Minerals - Locatable—See Forest-Wide Standards. Leasable ---- See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards.	
Facilities - Roads will be constructed as needed to meet the management area goals. Where existing trails are intersected by new road construction, the trail will be evaluated to determine if it should be retained on the system or abandoned.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection - Insect and disease control should emphasize reduction and prevention through timber harvest and timber stand improvement. The use of other approved integrated pest management techniques may be necessary at times. The appropriate fire suppression response ranges from control to containment in this management area depending upon location, expected fire behavior, and other decision criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions may be used in this management area, for the enhancement and maintenance of resources. Prescribed fire with planned ignitions may be used in this management area, for the enhancement and maintenance of resource, when within pre-established prescribed fire criteria. These criteria are detailed in the Fire Management Direction in Appendix R. Fuel reduction methods for activity created fuels include burning, removing residue, or rearranging, such as dozer trampling.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.
Riparian - Generally, harvesting will only occur in riparian areas in conjunction with sale activity on adjacent lands. In riparian areas, any timber harvest should be on a 240 year rotation and harvest types should be selection or group selection. See Forest Wide Standards for grazing in riparing.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Management Area W1 (86,100 acres)	
Description - This management area contains a variety of wildlife habitat ranging from important big game summer range to big game winter range. It has a variety of physical environments including riparian, calving or fawning areas, and hiding cover. All slopes, aspects and elevations are represented as well as a wide variety of vegetation ranging from grasslands to densely timbered areas.	**Management Goals -** Optimize wildlife habitat potential, including old growth, over the long term. Provide for other resource uses, if they are compatible with wildlife management goals.
Recreation – Controls over motorized recreation will be implemented where necessary to protect wildlife habitat values of this area. Nonmotorized dispersed recreation may be supported by constructing trails and trailhead facilities when compatible with management area goals.	The resulting travel decision would comply with this standard.

Management Standards	If Standard applies, how is standard being met
Visual – Management practices will generally follow guidelines for the partial retention VQO. Exceptions may occur on a case-by-case basis to meet wildlife objectives. The portions of this area (if any) that are within the sensitive viewing areas of the roads, trails, and areas listed in Appendix B will be managed to meet the VQOs noted in the appendix. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal.
Wildlife and Fisheries –Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance the quality of big game and nongame habitat. Maintain adequate thermal and hiding cover adjacent to forage areas. Generally this means providing at least 25 percent cover, where available, on identified winter range.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize other resource improvement practices.
Range – Livestock grazing generally does not occur in this management area, except for minor amounts within existing allotments. Livestock grazing will continue within active allotments, however, the level may be increased or decreased if monitoring or range analysis show a need or opportunity to change.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - Timber will be harvested only if it can be used as a tool to maintain or enhance wildlife habitat values. Productive forest land is classified as unsuitable for timber management	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils – See Forest-Wide Standards.	
Minerals – Locatable – Timing of mineral activities will be coordinated where practical with the needs of wildlife. This generally will require negotiations during development of operating plans for no surface occupancy during critical wildlife use. Leasable ---- See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards.	
Facilities – Roads will generally not be constructed for surface management activities within this area. Exceptions may occur if needed for wildlife improvement projects. Roads through this area, which provide access to adjacent areas, are permitted only if project planning indicates it is the most feasible access. Road construction should avoid important big game areas, such as wet, boggy areas.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.
Protection - Areas will be evaluated periodically for significant insect and disease problems. Endemic levels will be accepted as normal. If epidemic levels develop and control is necessary, the control method should minimize impacts on big game and other wildlife values. The appropriate fire suppression response ranges from control to confinement in this management area depending upon location, expected fire behavior, and other decision criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions will be used in this management area, for	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

Management Standards	If Standard applies, how is standard being met
the enhancement and maintenance of resources. Prescribed fire with unplanned ignitions may be used in this management area, for the enhancement and maintenance of resources, when within pre-established prescribed fire criteria. These criteria are detailed in the Fire Management Direction in Appendix R. Prescribed fire may be used as a tool to reduce natural fuels and improve quantity and quality of wildlife forage.	
Riparian –See Forest-Wide Standards for qrazing in riparian.	
Management Area W-2 (29,500 acres)	
Description: This management area consists of riparian and other lands that have forage, resting, and security characteristics and provide important spring, summer, and fall requirements for all big game species. Range allotments are in parts of the area. The variations in elevation, topography, slope, and aspect make these areas rich in species diversity.	**Management Goals -** Maintain and/or enhance habitat characteristics favored by elk and other big game species during spring, summer, and fall. Provide habitat diversity for non game wildlife species. Provide forage for both big game and livestock. Provide for other resource objectives as long as their uses are compatible with the wildlife and livestock objectives.
Recreation – Controls over motorized recreation will be implemented where necessary to protect wildlife habitat values of this area. Non-motorized dispersed recreation may be supported by constructing trails and trailhead facilities when compatible with management area goals.	The resulting travel decision would comply with this standard.
Visual – Management practices generally will follow guidelines for the partial retention VQO. Exceptions may occur on a case-by-case basis where necessary to meet the area goals. [See Forest Landscape Management Book, Vol. 2 (Ag. Hdbk. No. 462) for definitions of VQOs and how they are applied.]	This standard is not applicable to the Divide Travel Proposal
Wildlife and Fisheries – Most new roads and about 50% of existing roads will be closed, at least seasonally. Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance big game calving and summer habitat. Maintain adequate thermal and hiding cover adjacent to forage areas.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road construction.
Range – Livestock grazing will generally be maintained near the 1983 levels within existing allotments, unless monitoring or a range analysis indicates a need to change. Livestock grazing will not be expanded into new areas. Planning for livestock improvements, such as fencing and water developments, will be coordinated with the wildlife biologist.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber - Forested land is classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize timber

Management Standards	If Standard applies, how is standard being met
Timber harvest will be used only to maintain or enhance habitat values.	harvest.
Water and Soils – See Forest-Wide Standards.	
Minerals – *Locatable*: To the extent feasible, timing of mineral activities will be coordinated with the needs of wildlife and water. This generally will require negotiation during development of operating plans from May 15 to June 30. *Leasable*: See Forest Plan Amendment #13 for lease standards	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize mining operations.
Lands – See Forest-Wide Standards.	
Facilities –Road construction should not be necessary for surface management, however, roads can be built through the area to access other management areas or for minerals development. Road construction should avoid important big game areas, such as wet boggy areas. Road management will be used to minimize disturbance to big game during critical periods.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road construction or improvements.
Protection - Areas will be evaluated periodically for significant insect and disease problems. Endemic levels will be accepted as normal. If epidemic levels develop and control is necessary, the control method should minimize impacts on the big game summer range values. The appropriate fire suppression response ranges from control to confinement in this management area depending upon location, expected fire behavior, and other decision criteria related to values at risk. These decision criteria are stated in the Fire Management Direction in Appendix R. Prescribed fire with planned ignitions will be used in this management area, for the enhancement and maintenance of resources. Prescribed fire with unplanned ignitions may be used in this management area, for the enhancement and maintenance of resources, when within pre-established prescribed fire criteria. These criteria are detailed in the Fire Management Direction in Appendix R.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize fire suppression activities.
Riparian –See Forest-Wide Standards for grazing in riparian.	
Management Area P3 (32,900 acres)	
Description - This management area includes the Electric Peak Roadless Area recommended by the Helena National Forest for Congressional designation as wilderness. This recommendation is a preliminary administrative recommendation that will receive further review and possible modification by the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. Final decisions on wilderness designation have been reserved by the Congress to itself.	**Management Goals -** Manage the recommended wilderness additions to protect the wilderness characteristics and to the extent possible allow existing uses, pending Congressional classification.
Recreation - Visitor use may be restricted to prevent loss of solitude or unacceptable depreciation of the wilderness qualities.	The resulting travel decision will comply with this standard.

Management Standards	If Standard applies, how is standard being met
The limits of acceptable change (LAC) process may be used to determine if management actions are necessary to preserve natural environments and provide wilderness experiences	
Visual - Management practices will follow the guidelines for the preservation VQO.	This standard is not applicable to the Divide Travel Proposal.
Wilderness - If recommended Big Log addition receives wilderness classification, wilderness management direction will be the same as for the rest of the Gates of the Mountains, in Management Area P-2 Existing structures will be retained. If major rehabilitation or maintenance is needed, an assessment of the continued need and cultural significance will be completed.	This standard is not applicable to the project, as Big Log and the Gates of the Mountains Wilderness are located outside of the planning area. This decision is an administrative action and does not alter any existing structures in any way.
Wildlife and Fisheries - Wildlife habitat improvement projects will conform to Forest Service Wilderness Policy (FSM 2320). Fish stocking will conform to Forest Service wilderness policy. Stocking can continue in lakes where there is a history of such activity.	Relative to fisheries, fish stocking would not be affected by the travel plan project, and would continue in lakes under the direction of the Montana Department of Fish, Wildlife & Parks.
Range -Natural vegetative composition will be maintained. All existing range allotments may be maintained and managed in accordance with wilderness values. Existing livestock management improvements may be maintained. Additional structural improvements may be built only when necessary to maintain the wilderness values.	This standard is not applicable to this project. The resulting travel plan decision is an administrative action and does not authorize grazing or allotment management plans.
Timber -Timber harvest is not permitted. The management area is classified as unsuitable for timber management.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or ground disturbance.
Water and Soils - See Forest-Wide Standards.	
Minerals - Areas recommended for wilderness, Electric Peak and Mount Baldy, that currently have oil and gas leases will be managed under the stipulation of the lease until the lease expires. Applications for further oil and gas leasing will be accepted but not processed until the wilderness classification has been determined.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new mineral oil and gas leases. Mount Baldy is located outside of the planning area.
Lands -This management area is an exclusion area for utility corridors (See Appendix P).	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any additional, or changes to, utility corridors.
Facilities - Facilities and structures may be constructed to ensure the protection of the wilderness resource and safety of users. However, facilities may not be constructed solely to provide convenience to users. Trail construction is permitted and should be accomplished with minimal disturbance of the natural environment. Roads will not be constructed in this management area.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any new road or trail construction or improvements.

Management Standards	If Standard applies, how is standard being met
Protection - Areas will be evaluated periodically for significant insect and disease problems, such as mountain pine beetle. Endemic levels of insects and most disease agents that do not normally pose threats to adjacent lands will be accepted as naturally occurring. Control measure would be initiated only as a last resort if epidemics do not subside naturally and continue to threaten lands outside the proposed wilderness. Fire Management Direction in Appendix R will be implemented that permits unplanned ignitions to burn when within prescription, to perpetuate the natural plant and animal diversity. Suppression actions need to be compatible with wilderness management objectives The appropriate fire suppression response ranges from control to confinement in this management area depending upon location, expected fire behavior, and other decision criteria related to values at risk. These decision criteria will be stated in a Fire Management Action Plan.	This standard is not applicable to the Divide Travel Proposal. The resulting travel plan decision is an administrative action and does not authorize any timber harvest or fire suppression activities.

APPENDIX B. CUMULATIVE EFFECTS

The area to be analyzed in a cumulative effects analysis is usually not limited to the project area, and it varies with the resource or species being analyzed. Each resource will have different "boundaries" for its effects analysis. Quantified, detailed information regarding effects, leading to specific reasoned conclusions can be found in the cumulative effects section of each specialist report located in the project record. The following tables of past, present, and reasonably foreseeable projects have been used by the interdisciplinary team members in determining the cumulative effects for their respective resource. Each resource specialist has determined which of the following activities are applicable to their analysis, depending on their cumulative effects boundary. Some resource reports may mention a project that is missing from this table, however the "hard look" for analysis purposes has been taken.

Table B1 displays the Past Activities which have influenced the existing condition. Table B2 displays the Current and Ongoing Activities. These projects are in the implementation phase. Table B3 displays the Reasonably Foreseeable Activities. The projects in Table B3 are still in the planning phase, which means there is potential for change due to public input, changed conditions, etc.

Table B1. Past Activities

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Moose Creek Campground, Ten Mile Day Use Area Hazard Tree Removal	2010	Removal of hazard trees in the Moose Creek Campground and at Ten Mile Day Use area located off the Ten Mile / Rimini Road
Road Drainage Repairs	2010	Roads 136, 314, 335, 571, 571-C1, 708, 1805 and 1855; Blading 54.2 miles; construct drain dips 286; clean cattle guards 12, install 1 new 18" culvert
Tree Farmer Road	2010	Resource Advisory Council: Phase I Road 314 reconstruct 2.4 miles; 4" new surface aggregate for 1.8 miles; construct 2 drain dips; install 2 new 18" culverts Phase II Road 314 reconstruct road for 1 mi.; new surface aggregate for 1.2 miles; construct 2 drain dips
Spring Gulch	2010	Spawning & rearing habitat improvement in the headwater tributary of Dog Creek, a 303(d) listed stream, includes construction of about 1.5 miles of fence along the banks of about 0.6 miles of stream. Both 3-strand barbed wire & jack rail fence would be used. Stream banks & channel would be hardened at the upper end of the exclosure in anticipation of heavier use following construction of the fence. .

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Minnehaha Road	2010	Legacy Road: Road 527 recondition 4.9 miles, construct 3 drain dips; 4” new surface aggregate on 1.15 miles; install 36 new 18” culverts; replace 2 undersized culverts w/ lager culvert
Hahn Creek Roads	2010	American Restoration & Recovery Act: Road 495 replace undersized Hahn Creek culvert w/ a 123” span by 83” rise by 40’ corrugate steel pipe arch Road 1856 replace undersized culvert w/ a 123” span by 83” rise by 40’ corrugate steel pipe arch
Telegraph Creek Roads	2009-2010	American Restoration & Recovery Act: Road 495 reconstruct 4.1 miles; 4” new surface aggregate for 4.1 miles; dust palliative 1.4 miles; install 24 new 18” culverts; replace 5 undersized culverts w/ larger culverts Road 1856 install 7 new culverts; replace 4 undersized culverts w/ larger culverts Road 1857 install 7 new culverts
Little Blackfoot Roads	2010	American Restoration & Recovery Act: Road 227 recondition 6 miles; 4” new surface aggregate for 6 miles; dust palliative 6 miles; install 8 new 18” culverts; install 1 new 24” culvert; raise roadbed 2’ for 200’ just south of Hat Creek to protect roadway during spring runoff
Hope-Dog Creek Road	2010	American Restoration & Recovery Act: Road 571 reconstruct 8.03 miles; 4” new surface aggregate for 8.03 miles; install 10 new 18” culverts; replace 1 undersized culvert w/ a 24”
MT Army National Guard	November 2010	Permit for winter survival training on MacDonald Pass
Thomas Brothers Lumber	December 2009	Hat Creek & Little Blackfoot – Commercial Road Use Permit
Zucconi Private Road	November 2008	Road construction of about 2,000 feet
U.S. Hwy 12 Improvements		Removal of vegetation (4 to 5 log truck loads), installation of guard rails, erosion protection, and sanding/salting.
Continental Divide Trailhead (CDNST)	July 2009	Construction of approximately seven miles of new CDNST to reroute the trail to the Continental Divide. This new segment connects to the Bison Creek Area where the CDNST trail leads onto the neighboring Beaverhead-Deerlodge National Forest.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Cromwell & MacDonald Pass Hazard Tree Removal	September 2008	This decision removed approximately 2,000 dead and dying trees in the developed recreation sites and areas located to the south of MacDonald Pass which encompassed Cromwell Dixon Campground, MacDonald Pass CDNST Trailhead, and the former Quigley Group Use Area. Trees were whole tree yarded by tractor to designated areas.
Blizzard Basin Water Developments CD	June 2008	An old water development was replaced in addition to one new water development. Both water developments were installed to collect water in a conventional headbox with a pipe attached to fill a tank at each location.
Special Recreation Use Permit Tri-Arabian Horse Club Judged Trail Ride	June 2007	This special recreation use permit authorized the Club to use existing trails and routes located west of Helena, Montana in the Sweeney Creak Area. This non-motorized event authorized up to 75 participants and spectators that occurred September 9 and 10, 2007.
North Pasture Division Fence	March 2006	Installation of this fence enabled the permittee to get better cattle distribution in the eastern portion of the pasture that did not receive very much use until this fence was installed. In addition, it helped keep cattle off the Frog Pond areas as well as off Elliston Creek. It also shortened the season of use for two parts of the pasture
Continental Divide Trailhead & Connector Trail	August 2005	Construction of trailhead and approximately ½ mile of new road to access the trailhead and approximately ½ mile of connector trail to tie in with the existing Continental Divide National Scenic Trail
Special Use Permit to the U.S. Army/Montana National Guard Sweeney Creek land Navigation Course	September 2004	This special use permit authorized the National Guard to use the Sweeney Creek area for land navigation exercises in the spring and fall. Monitoring of wildlife for potential effects was required due to winter range concerns.
North Western Corporation Rimini Extension	July 2004	Authorized installation of a short segment of 0.6 kV aerial power line on NFS lands in the Ten Mile drainage. North Western Corp. was issued a Special Use Permit authorizing installation, use and maintenance of a 75-foot power line.
Special Use Permit for Renovations to the MacDonald Pass Electronics Site	June 2004	This special use permit authorized the State of Montana Department of Transportation, Lewis & Clark County Sheriff's Office, and the Federal Aviation Administration to cooperatively construct and share the cost of maintaining a new repeater building and tower. This facility houses local, state, and federal government communications users at the site located at the established MacDonald Pass Electronics Site.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
North Western Corporation Moose Creek Utility Extension	February 2004	This decision authorized the North Western Corp. the installation, use & maintenance of a 0.6kV buried power line in the Moose Crk drainage. This action includes a 30-foot power line & power pole.
Jericho Mountain Continental Divide Trail Reroute	April 2003	This decision implemented new trail construction of approximately 2.2 miles of the CDNST #337 to align the trail to the Continental Divide as per Agency guidance.
Salisbury Private Road FLPMA Easement	January-1993	An easement to construct, and maintain a private road across NFS lands was issued to Mr. and Mrs. Salisbury under the Federal Land Policy and Management Act to provide permanent access to their private property and home.
Society for Creative Anachronism Historic Recreation Special Use Permit	August 2002	This one-time special use permit was issued to the Society for Creative Anachronism Historic Recreation Group for a group event from August 21-25, 2002. Participants are in historic dress and partake in battle scenarios. The main gathering and events occurred at the Lions Sunshine Camp with overflow parking at the snowmobile trailhead located near the camp along the Little Blackfoot Road FSR #227.
Eakin Encroachment	August-2002	Continued use of a small tract on NFS lands currently occupied by an encroaching privately owned garage. A special use permit for occupancy of .04 acres was issued to Kirk and Cathy Eakin.
Capital Trail Vehicle Association (CTVA) & Montana Trail Vehicle Riders Association Annual Campout	July 2002	This one-time special use permit was issued to CTVA/Montana Trail Vehicle Riders Association to hold their annual statewide campout in the Mullan Pass Area from July 3-7, 2002.
Zucconi Private Road and Utilities	August 2002	Road construction of about 290 feet on NFS lands using a Private Road special Use Permit authorizing construction, use and maintenance of the access ROW.
Kerner Private Road	January 2002	Authorization of about 3,000 feet of private road on NFS lands using a Private Road special Use Permit allowing reconstruction, use, and maintenance of the access ROW.
Senecal Private Road	January 2002	Authorization of about 500 feet of private road on NFS lands using a Private Road special Use Permit allowing use and maintenance of the access ROW.
McMahon Private Road	October 2001	Authorization of the continued use and maintenance of about 2,940 feet of private road on NFS lands using a Private Road Easement on the access ROW.
Rock Creek Buffalo, Inc. Private Road	June 2001	Authorization to reconstruct, use & maintain about 2,400 feet of private road on NFS lands using a Private Road special Use Permit for the access ROW.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Touch America, Inc. Fiber Optic Installation	September 2000	Authorization to install, use and maintain six underground two-inch fiber optic ducts, one duct installed w/ a fiber optic cable, on NFS lands near Hwy 12 on MacDonald Pass using a Construction Special Use Permit followed by a single, consolidated, region wide Special Use Permit. About 1.15 acres within the paved/gravel shoulder of Hwy 12.
D&G Lumber Private Commercial Road Use	September 2000	A private road special use permit was issued to Rock Creek Buffalo, Inc. authorizing the reconstruction, use, and maintenance of approximately 2400 feet of private road on NFS lands. Public motorized use of this right-of-way was prohibited.
Continental Divide Trail Reconstruction Phase 1	April 1999	Phase I entailed the construction/reconstruction on several non-motorized segments of CDNST #337 near MacDonald Pass, Mullan Pass to Priest Pass, and Black Mountain.
Special Use Permit to the Montana Department of Corrections and Aspen Youth Alternatives (AYA)	December 1998	This temporary special use permit was issued to the Montana Department of Corrections for institutional outfitting provided by AYA. The outfitting occurred in the Little Blackfoot Area. Yurts were installed at Monarch Creek Trailhead and the Little Blackfoot Meadows Trailhead.
Robert Miles Mining Plan of Operation	July 1998	Approved the Plan of Operations to conduct exploration of the Bugler unpatented mining claim in Charity Gulch including two exploration trenches 70 feet long, 3 feet wide and 7 feet deep. Reclamation consisted of back-filling, seeding and removal of all mining equipment once reclamation was completed.
Monarch Creek Trail Reconstruction	June 1998	Construction/reconstruction of the non-motorized Monarch Creek Trail #362 in the Electric Peak Roadless Area. Work includes installation of 65 water-bars , 3 wooden stock bridges, and 3 French Drains; reconstruction of 5 switchbacks; construction of a turnpike approximately 25 meters long, obliterate approximately 727 meters of abandoned trail and grub approximately 560 meters of existing trail.
Frontier Town Monument, Sign, and Power Line	February 1998	Re-issuance of a Special Use Permit to Erik Little, the new owner of Frontier Town for the private-owned monument, sign, and power line on 0.22 acres of NFS lands.
Elliston Volunteer Fire Department Fund Raiser 5-year Special Use Permit for a Recreation Event	January 1998	Issuance of a 5-year Special Use Permit authorizing a snowmobile charity ride to raise funds for the Elliston Volunteer Fire Department. The ride occurred on existing groomed snowmobile trails located in the Little Blackfoot/Telegraph Area.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Treasure Mountain Snowmobile Trail Relocation	November 1997	This decision approved relocating segments of the groomed snowmobile trail in the Treasure Mountain area. Segments included Little Blackfoot River Road, FSR 1857-A1, FSR 1857, FSR 1857-D1, FSR 1859 to the Telegraph Creek Road. Another section starts on FSR 1857 at the junction with FSR 1857-B1 and proceeds on FRS 157-B1 to Ontario Creek Road 123.
Austin Snowmobile Parking	November 1997	This decision approved the construction a parking area located north of the Austin Creek Road. Approximately ½ acre was cleared to accommodate parking for snowmobile use in the winter months.
Minnehaha Creek Private Commercial Road Use	October 1997	Authorization for a private commercial use of NFS lands and road (approximately 2.9 miles) in the Minnehaha Creek area for the transporting and decking timber products. This included construction and use of a 400-foot temporary skid trail and use of six decking areas using a Special Use Permit.
BR Cattle Company Special Use Permit; livestock Area in Hope Creek	June 1996	Authorized the use of NFS lands in the Hope Creek drainage for livestock grazing using a Special Use Permit allowing grazing of cattle on 200 acres. At the time these NFS lands were surrounded by private land.
Private Road Special Use Permit to Mary Maras	June 1996	A private road special use permit was issued to Mary Maras. This authorized the reconstruction use and maintenance of 60 feet of private road located on NFS lands in the Ophir Creek Drainage.
Hope Creek Temporary Road Construction and Commercial Use	October 1995	Authorized construction of approximately 185 feet of temporary road across NFS lands in the Hope Creek drainage. This provided short-term access to adjacent private lands to harvest trees. In addition, this permit authorized commercial use of existing Forest System Roads #571, #708, #1855 for transport over a three-year period.
Montana Bureau of Mines and Geology Seismic Monitoring Station	July 1995	Installation, use, and maintenance on a seismic monitoring station on lands administered by the Helena Ranger District.
TRI Fiber Optic Installations	May 1995	Authorized installation, use, and maintenance of two fiber optic lines on NFS lands. Location for both buried and aerial lines use ROW already being used as utility/gas lines.
Red Mountain/Park Commercial Road Use	March 1995	Authorized private commercial use of FSR in the Red Mountain/Park Lake area to transport timer products off pvt property. FSRs will be maintained & used of about 4.2 miles of FDR #4009, 1.3 miles of FDR #4009-B1, 0.1 miles of FDR #1878-C1, and 0.5 mile of non-system roads using a Road Use Permit.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Bullion Parks/Telegraph Creek Private Commercial Road Use	December 1994	Authorized commercial use of NFS lands and roads in the Jericho Mountain area to transport timber products off private property, which includes construction of approximately 1200 feet of temp skid trail and docking areas, and use of about 5.4 miles of existing FS roads for haul.
Cellular Telephone Authorization; MacDonald Pass Electronics Site	October 1994	Authorized the use of NFS lands to install, operate and maintain a commercial cellular telephone facility on the MacDonald Pass Electronics Site
Amateur Radio Authorization; MacDonald Pass Electronics Site	October 1994	Authorized the use of NFS lands to install, operate, and maintain an amateur radio system to co-locate within the U.S. Government facility at the MacDonald Pass Electronics Site.
Snowshoe Creek Private Commercial Road Use	July 1994	Authorized commercial road haul on approximately 0.7 miles of FDR #708 in the Snowshoe Creek drainage. This allowed short-term access to private lands for timber harvest and log haul of about 200 MBF using a minor special use of NFS lands.
Stowe Commercial Road Use	May 1994	Commercial use of approximately 4-5 miles of existing forest system roads located in the Little Blackfoot/Treasure Mountain area of the HNF. The permit also authorized the installation of a temporary bridge to cross the Little Blackfoot River.
Irish Hill Project Phelps Dodge Mining Company Mining Plan of Operation	June 1993	Approval of a plan of operations to conduct exploratory drilling on unpatented mining claims located on NFS lands in on the ridge that separates the Trout Creek and Spotted Dog Creek drainages.
Ophir Group Project American Copper & Nickel Company, Inc. Mining Plan of Operations	May 1993	Approved a plan of operations for this project for exploratory drilling on the unpatented mining claims in Ophir Gulch on NFS lands. This project includes 6 diamond drill holes.
Lava Mountain Timber Sale	March 1993	Decision Notice to harvest about 1.8 MBF on 185 acres including about 0.3 miles of new road & re-construct and additional 0.2 miles of existing road.
Grazing Permit Renewals	December 1992	10-year permit for the Hat Creek, Ophir-Hope allotments in Powell County Ten Mile-Priest Pass allotment in Powell & Lewis & Clark County, and McClellan allotment in Broadwater County
Dog Creek Road Improvement	September 1992	This decision included clearing of trees and other vegetation for a distance of approximately 10 feet on either side of 0.8 miles of the existing Dog Creek Road.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Mullan Pass Timber Sale	August 1992	This decision notice approved harvest of about 2.5 million board feet from about 200 acres including construction of 1.1 miles of road and reconditioned about 3.9 miles. Harvest techniques included 31 acres of clearcut, 120 acres of shelterwood/reserves, and 50 acres of group selection. A key mitigation incorporated a number of roads closed during big-game hunting season to meet FP open road density.
Mining Plans of Operation for Clemmer Gulch & O'Keefe Mountain Projects	June 1992	Approved plans of operation for an unpatented claim in the headwaters of the Telegraph and Ontario Creek drainages. The plans called for use of existing Co. and FSRs to access the projects and 2,500 feet of temp access to eight drill sites with constructed, level, 60x60 foot drill pads. An estimated 1.5 total acres of surface disturbance was expected. At the O'Keefe Mountain Project about 700 foot of new temp access toad was constructed to four drill sites with about 0.5 acres of disturbance anticipated.
Montana Army National Guard Special Use Permit	April 1992	Issued a temp special-Use Permit authorizing the Guard to conduct a small training exercise in the Greenhorn Mtn area. Training was on land navigation and occurred over a two-day period by approximately 40 personnel in May..
Mike Renig Mistletoe Sale	April 1992	Authorized harvest of about 49 thousand board feet of sawlog material and 24 thousand board feet of post and pole material from about 9 acres.
Hurd Creek Winterkill Salvage Sale	February 1992	Decided to harvest dead and winter-damaged LP, post/pole, and sawlog material form about 6 acres that yielded about 40,000 board feet of material. There were no new roads.
Cozzie Special-Use Private Road	January-1992	A special use permit was issued to Mr. and Mrs. Joseph Cozzie that authorized the reconstruction, use, and maintenance of approximately 265 feet of existing road across NFS lands in order to provide access to adjacent private lands.
BR Cattle Company Permit Issuance	December 1991	This decision issued a 10-year grazing permit on the Spring Gulch allotment with improvements.
Ophir Group Project American Copper & Nickel Co., Inc. Mining Plan of Operations	October 1991	Approved a mining Plan of Operations, which included exploratory drilling on their unpatented claim in Ophir Gulch. Included was drilling of 7 reverse circulation drill holes requiring minor reconstruction of existing roads and wheel tracks with surface disturbance estimated at about 0.3 acre. Reclamation was included.
Upper Telegraph Winter Killed Timber Salvage	September 1991	Decision included harvest of dead and damaged trees outside of IRA using existing roads over about 131 acres yielding 1.1 mmbf. Light to moderate road reconstruction was on about 1.6 miles of existing roads. Temp spurs, <1/4 miles, was used to access some units and were fully obliterated after harvest.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Minnehaha Trail Project	September 1991	Decision authorized the development of a trail route between the Moose Creek work center and Forest Road 527 using an old abandoned railroad bed. Activities included construction of a bridge, installing a culvert, pruned trees and shrubs, removed rocks, and relocated power poles off the railroad bed.
Greenhorn Mistletoe Timber Sale	September 1991	Commercial harvest on 10 acres of approximately 56,000 board feet of deteriorating, decadent, mistletoe LP.
Hahn Creek Commercial thinning	September 1991	Commercial thin up to 10 acres of overstocked LP yielding 20,000 to 30,000 board feet of post, pole, and rail material.
Lost Posts Timber Sale	September 1991	Commercial thin a 10-acre forest stand, yielding approximately 100,000 board feet of post and pole material.
Spring Gulch Winterkill Salvage Timber Sale	September 1991	Salvage harvest dead and dying trees from 3 acres yielding about 25,000 board feet of DF.
Ten-Mile Creek Gravel Source Drilling	July 1991	Authorized construction of approximately 580 feet of private road across NFS lands for short-term access to a gravel source. Up to 5 core sample test holes were implemented with the road obliterate and revegetated after completion of the sampling.
John T. and Merrylee McCrea small Tracts Case	July-1991	The Forest Service sold 2.8 acres that contained three tracts of mineral fractions virtually surrounded by patented mining claims to John T and Marylee McCrea in order to improve management and adjust property boundaries.
U.S. West Buried Phone Line	June 1991	This decision authorized installation of a buried phone line across NFS lands within the ROW of FSR #137 under a special-use permit.
Elbert and Leslie Bressie Grazing Permit Issuance	June 1991	A 10-year grazing permit was issued to Elbert and Leslie Bressie to graze domestic livestock on the Spotted Dog/Trout Creek allotment of the Helena Ranger District.
Winter Killed Timber Salvage McGuithy Environmental Analysis	June 1991	Harvest of about 44 acres of winter-damaged trees yielding 0.232 mmbf with no new or temp roads.
Winter Killed Timber Salvage Hope/Snowshoe Timber Sale Sales	April 1991	A categorical exclusion was used for analysis

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Hat Creek Cattle and Horse Allotment	November 1990	This was an updated allotment management plan for the Hat Creek C&H allotment. This involved the incorporation of two sections of land from the adjacent Spotted Dog/Trout Creek allotment and the implementation of a three pasture deferred rotation system. Approximately 5 miles of barbed wire fence was also constructed.
MacDonald Pass Cattle and Horse Allotment	November 1990	This was an approved updated allotment management plan for the MacDonald Pass C&H allotment. This involved the implementation of a three pasture deferred rotation system and construction of approximately 0.5 miles of barbed wire fence.
Phelps Dodge Karger II Project Mining Plan of Operation	August 1990	An environmental assessment was used for analysis
Hurd Creek Public Post & Pole Area	July 1990	This decision opened up 12 acres of dead and dying LP along forest road 314 to public post and pole harvest.
Winter Killed Timber Salvage Ophir Creek & Cave Gulch Timber Sale Areas	June 1990	This decision permitted harvest of reasonably accessible winter mortality using regeneration and sanitation cuts and only those areas with 70% or greater winter kill. Harvest occurred on about 220 acres yielding roughly 1.2 mmbf. About 1.1 miles of new roads and 0.3 mile of road reconstruction were needed.
Mining Plan of Operations for Karger Lode Claims	October 1989	A categorical exclusion was used for analysis
EA Continental Divide National Scenic Trail on Federal Lands	April 1989	An environmental assessment was used for analysis
Clancy Cattle & Horse Allotment Revision	July 1988	Decision approved implementation of a modified rest rotation grazing system for the Clancy allotment. This was agreed to with the grazing permittee at that time with some stipulations. Some changes included moving two cattleguards, installing three new cattleguards, relocating or installing seven miles of fence, reconstructing two miles of boundary fence & removal o one mile of fence.
Chessman Reservoir Complex-Repair and Management	February 1988	Issued the City of Helena a permit authorizing the Chessman Reservoir and dam rehabilitation work subject to mitigation along with associated facilities.
Rimini Abandoned Mine Reclamation Project Drilling of Water Quality Monitoring Well	July 1988	Approved a plan to drill a well for sampling groundwater quality near Ten-Mile Creek,

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Treasure Mountain Timber Sale	August 1987	About 519 acres of clearcut timber harvest and 57 acres of basal area reduction. About 6.2 mmbf would be removed between watersheds around Telegraph Creek. This decision included 6.7 miles of new roads, 7.8 miles of re-construction.
Chessman Minerals Pit Site	July 1987	Determined that this pit site is ideal to be used for repair and maintenance of existing forest roads.
Irish Mine Assessment	April 1987	Implements treatment to increase and maintain forage production through the use of prescribed fire.
Priest Pass Resurfacing Project	February 1987	This action improved existing forest roads through repair and maintenance. Priest Pass road (FSR #335) was resurfaced with approximately 4 inches of crushed aggregate surfacing on 5.5 miles of the 14 foot wide road. This was completed to reduce erosion damage and improve access for timber management and public use activities. The installation of additional culverts, other drainage structures, and erosion control seeding was implemented to further reduce sedimentation.
U.S. Arm/Montana National Guard	March 2004	Special use permit for training maneuvers
U.S. Army/Montana National Guard	January 2004	Special use permit for training maneuvers
Phelps Dodge Mining Co.	July 1989	Mining Plan of Operations; an environmental assessment was used for analysis
Road Drainage Repairs	Completed 2009	Roads 123, 227, 495, 495-D1, 495-E1, 527, 1856, 1856-D1, 1856-E1, 1856-J1, 1857, 1857-D1, 1863, 1863-A1 and 4104; Blading 43.2 miles, construct drain dips 231
Kading Campground	2010-2011	A culvert near the campground entrance has been replaced with a bridge that meets 100-year flood requirements. Beetle infested hazard trees have been removed in Kading CG & around Kading Cabin for visitor safety. Shrubs & trees have been planted to improve aesthetics. Camping spurs have been lengthened & widened w/ some converted to pull-through spurs. New picnic tables and fire rings have been installed throughout the campground & at Kading Cabin to American Disability Act (ADA) standards. Pathways to the existing vault toilets have been widened & improved to ADA standards. Curb stops have been installed & a new visitor information kiosk has been erected at the campground entrance.. A single-panel kiosk has been installed at the nearby Blackfoot Meadows Trailhead.

PAST		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Nevada/Ogden Bridge	2011	American Restoration & Recovery Act
Kading Road	2011	Aquatic Organism Passage Legacy Road: Road 227 replace undersized Kading Creek culvert with a 30' span by 26' wide concrete bridge
Sally Anne Road	2011	Aquatic Organism Passage Legacy Road: Road 527 replace undersized Sally Anne culvert with a 12' span by 4' rise by 40' long three sided concrete box culvert
Clark's Canyon Road	2011	Aquatic Organism Passage Legacy Road: Road 4005-A1 replace undersized Clark's Canyon Creek culvert with a 128" by 83" by 48' long corrugated steel pipe-arch
Fields Road	2011	Aquatic Organism Passage Legacy Road: Road 1842 at mile post 0.5 replace 36" diameter CMP w/ 28' spill through bridge
Sawmill Road	2011	Aquatic Organism Passage Legacy Road: Road 571 at mile post 14.2 replace 18" diameter CMP w/ 28' span spill through bridge
Highway 12 Hazard Tree Removal along MacDonald Pass	2010-2011	Removal of hazard trees along the north side of Highway 12 on MacDonald Pass
Prickly Pear Sport Shooting Association Shooting Range Hazard Tree Removal	2010 – 2011	Removal of hazard trees around the access road, parking area and three target ranges
MacDonald Pass Cross-Country Ski Trails Hazard Tree Removal	2011	Beetle-killed trees within 1½ tree lengths of the MacDonald Pass cross-country ski trails were cut down in order to remove the hazard to skiers in winter and other recreationists (berry pickers, walkers) during the rest of the year. In reponse to comments by local environmental groups, downed trees were not removed, but were left in place or, in many cases, decked in parallel piles alongside the trails to block drifting snow in winter. roughly 180 acres were treated.

Table B2. Present and Ongoing Activities

Present/Ongoing		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Prickly Pear Sportsmen's Association Target Range	December 2000 Ongoing	This 20-year Special Use Permit for a 9-acre facility that includes an access road, gate/perimeter fence, parking lot, 3 ranges, storage shed, and toilets.
11 Recreation Residence Tracts	Ongoing	Residences are authorized under a 20-year Special Use Permit. Lots are typically 1 acre or less in size. These cannot be utilized as a primary residence and can only be used less than six months in a calendar year. Six are located in the Forest Heights Tract and are issued to: Bernard F. Christiaens, Donald Garrity, William Lee Greiner, Tim & Heidi O'Brien, Margaret Regan,, William A. Brown III, and Mike Wall. Five recreation residences are permitted within the Moose Creek VillaTract and are issued to: (Lee & Lola Cloninger; Duane A. and Sandi Fernholz; Paul F and Dianne Hamper and Helen Curtis. (use code 123)
2 Campgrounds 2 Day Use Areas 2 Rental Cabins	Ongoing	Campgrounds are open seasonally from May through October and include: Kading, Cromwell Dixon, and Moose Creek. Day use areas: Ten Mile Picnic Area, and the Continental Divide Trailhead. Rental Cabins: Kading and Moose Creek
Routine Use and Maintenance of Non-motorized Forest Trails for Summer Use	Ongoing	There are some non-motorized trails in the Ten Mile Drainage including: Ten Mile Environmental Trail and the Switchback Ridge Trail. Other areas: Continental Divide National Scenic Trail, Little Blackfoot Meadows trail, Monarch, and Larabee Gulch. These trails receive routine maintenance and clearing of debris annually.

Present/Ongoing		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Routine Use and Maintenance of Forest trails and areas for over-snow winter use Approximately 10 miles groomed Cross-Country Ski Trails	Ongoing	MacDonald Pass Cross-Country Ski Trail system is located near the Forest Heights Recreation Residence. Approximately 10 miles are groomed by the Helena Last Chance Nordic Ski Club as per a cooperative agreement between the Helena NF and Club starting on or after December 2 up to May 15 depending upon snow levels. The formerly Quigley Group Use Area/Campground is used by cross-country skiers The former Moose Creek Group Use Area is utilized as a snowmobile trailhead accessing a trail system that connects to Bullion Parks over to Jericho Mountain and down along the Hahn Creek Road tying into the Little Blackfoot Road and Kading Cabin /Limburger Springs areas. There is also a snowmobile trailhead located off of the Little Blackfoot Road near the Lions Sunshine Camp. Another over-snow vehicle system is in the Mullan Pass and Blossburg areas. Please refer to the Divide Travel Plan alternative maps for specific trail locations and areas open to over-snow use.
MacDonald Vista Point	Ongoing	This vista point is located to the south of MacDonald Pass and is a popular observation site. It accesses the Continental Divide National Scenic Trail. During the winter months, this area has been utilized for non-motorized environmental education programs.
Special Recreation Use Permit Helena Lion's Sunshine Camp	Ongoing	This authorization is classified as an Organizational Camp issued to the Helena Lion's Club to manage and operate the Lion's Sunshine Camp located in the Blackfoot River drainage on NF lands. The camp provides recreational opportunities in a rural environment to families and youth oriented groups. This camp has been under a special use permit since 1943. (use code 113)
1 Special Use Permit for Monument	Ongoing	This permit is to the Grand Lodge A.F. and A.M. of Montana for their monument located near Mullan Pass. (use code 332)

Present/Ongoing		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Micro-Wave Electronic Sites north & south of Hwy 12 on MacDonald Pass	Ongoing	Both are under a Special Use Permit with the north site about 40 acres and includes 7 communication facilities and about 15 permit holders accessed by the Microwave Road. The south site retains 1 authorized airport beacon near the Vista Point overlook.
Routine Use and Maintenance of Open Forest Roads	Ongoing	Routine maintenance not necessarily annually includes blading, brushing, culvert cleanout, etc. Use of Forest Roads varies by route and season with use of Forest Heights Road limited to residence permittees.
Power Utilities, Phone Utilities, Yellowstone Gas Pipeline, & Touch America Fiber Optic Lines	Ongoing	Utility lines are authorized under the terms of a special use permit. The gas and fiber optic line are co-located. Routine maintenance are accepted and understood under the terms of the permit. Located at & near MacDonald Pass.
MT Army Nat. Guard High Elevation Helicopter Landing/Take Offs & Water Bucket Training	Decision on January 2010	This decision issues a special use permit to the MT Army Nat. Guard to utilize Red & Lava Mountain for these landing & take off maneuvers during the months of June & December. Red Mountain is the only peak within the Divide Travel project boundary.
14 Private Road Special Use Permits issued to private landowners	Ongoing	These permits were issued to private landowners to access their private land on roads that are primarily not open to public use and some have seasonal closures. They are located throughout the project area.
Roadside Hazard Tree Reduction Implementation	Ongoing	The purpose of this proposal is to reduce the public safety hazard by removing hazard trees along approximately 491 miles of open system roadsides, campgrounds, and administrative sites. Some of the areas will have slash treatments and burning of slash piles.
Chessman Reservoir Complex & Waterlines/Ditches	Ongoing	The City of Helena was issued a special use permit to maintain the Chessman Reservoir and associated waterlines/ditches for providing potable water to the City of Helena.. This reservoir and water system is located in the Red Mountain Area.
Highway Maintenance Station under a special use permit	Ongoing	This is under a special use permit issued to the Montana State Department Commission. The station is located on the upper east side of MacDonald Pass on the west side of US Highway 12.
4 Natural Resource Conservation Service Snotel Sites under a special use permit	Ongoing	The NRCS maintains four sites for monitoring snow depth and water content under a special use permit. They are located near Chessman Reservoir, Frohner Meadows and Ten Mile Creek.
Timber Harvest on Private Lands	Ongoing	Timber harvest may occur on private lands on unspecified acres, primarily tractor logging within the planning area

Present/Ongoing		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Noxious Weed Treatment on National Forest Lands	Ongoing	Herbicide treatment is primarily along roads and in patches that are accessible to mechanized equipment (spraying with ATVs) and/or by hand, biological (insects), goats/sheep, and aerial spraying. Treatment areas are identified in the EIS/ROD and are continually updated and treated as new infestations are located.
Grazing Activities on BLM, State, and Private Lands	Ongoing	Grazing of cattle, sheep and horses on private lands within the Divide Travel Planning Area. This may result in impacts to riparian vegetation, stream banks, and upland vegetation. There will also be results to vegetation management, forage production, and economic well-being.
Blossburg C&H Grazing Allotment	Ongoing	10,657 acres in project area; 350 permitted cow/calf pair; 107 permitted use days; start of permit in mid June; deferred grazing system; resides on both sides of the divide.
Clarks Canyon Grazing Allotment	Ongoing	5,910 acres in project area; 121 permitted cow/calf pair; 100 permitted use days; start of permit late June; season long grazing system; resides west if the divide.
Deadman Lost Horse C&H Grazing Allotment	Ongoing	6,747 acres in project area; 44 permitted cow/calf pair; 92 permitted use days; start of permit in July; deferred grazing system; resides east of the divide
Dog Creek Grazing Allotment	Ongoing	1,729 acres in the project area; 80 permitted cow/calf pair; 92 permitted use days; start of permit is in July; resides west of the divide for season long grazing Data collected 2009
Drumlummen Skelly C&H Grazing Allotment	Ongoing	3,592 acres in project area; 230 permitted cow/calf pair; 40 permitted use days; start of permit varies July-Oct; rest rotation grazing system; resides on both sides of the divide
Empire Grazing Allotment	Ongoing	1,042 acres in project area; 66 permitted cow/calf pair; 68 permitted use days; start of permit is in July; resides on both sides of the divide under a rest rotation grazing system.
Frohner Grazing Allotment	Ongoing	485 acres in project area; 76 permitted cow/calf pair; 102 permitted use days; start of permit use is July; season long grazing system that resides east of the divide

Present/Ongoing		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Hat Creek C&H Grazing Allotment	Ongoing	8,207 acres in the project area;140 permitted cow/calf pair; 102 permitted use days; start of permit in late June; resides west of the divide and is under a deferred grazing system. Data collected 2009 A 10-year grazing permit was issued to Senecal Brothers Ranch for the grazing of domestic livestock on the Hat Creek C&H Allotment in Powell County, Montana on the Helena Ranger District.
MacDonald Pass Grazing Allotment	Ongoing	6,901 acres in project area; 104 cow/calf pair; 115 permitted use days; start of permit in late June; resides on both sides of the divide and is under a deferred grazing system.
Ophir/Hope C&H Grazing Allotment	Ongoing	13,528 acres in project area; 192 permitted cow/calf pair; 99 permitted use days; start of permit in late June; season long grazing system; resides west of the divide. A 10-year grazing permit was issued to Senecal Brothers Ranch for the grazing of domestic livestock on the Ophir/Hope C&H Allotment in Powell County, Montana on the Helena Ranger District.
Slate Lake C& H Grazing Allotment	Ongoing	9,331 acres in the project area; 205 permitted cow/calf pair; 92 permitted use days; start of permit in mid June; deferred grazing system; resides west of the divide. Data collected 2009
Spotted Dog Grazing Allotment	Ongoing	8,453 acres in the project area; 245 permitted cow/calf pair; 102 permitted use days; start of permit is in July; resides west of the divide for season long grazing. Data collected 2009
Spring Gulch C&H Grazing Allotment	Ongoing	3,613 acres in project area; 45 permitted cow/calf pair; 62 permitted use days; start of permit in mid July; season long grazing system; resides west of the divide A 10-year grazing permit was issued to BR Cattle Company for the grazing of domestic livestock on the Spring Gulch C&H Allotment of the Helena Ranger District.

Present/Ongoing		
Project/Activity Name	**Decision Date and/or Status**	**Brief Description**
Tenmile Priest Pass C&H Grazing Allotment	Ongoing	15,990 acres in project area; 200 permitted cow/calf pair; 107 permitted use days; start of permit mid June; rest rotation; resides on both sides of the divide. 2003 Contract for the Priest Pass and Black Mountain allotments, range conditions and weed inventories were completed under a contract. In 2009 proper functioning condition was reached on Mike Renig. A 10-year grazing permit was issued to the RV Ranch Ranch for the grazing of domestic livestock on the Hat Creek C&H Allotment in Powell and Lewis & Clark Counties, Montana on the Helena Ranger District.
Snowshoe Exploration	Ongoing	Proposal to dig 12 test holes down to bedrock and remove samples for testing.
10-Mile EPA Reclamation	2010 - 2012	Reclamation/removal of approximately 40 to 50,000 cubic yards of soil from a road, residence, and the old Basin Creek Mine at the town of Rimini. Reclaimed sites will be re-vegetated. This project is on-going
Bald Butte Mine & Mill Site DEQ Reclamation	2010-2012	Approximately 3.5 miles southwest on Marysville on patented mining claim surrounded by BLM and HNF. Approximately 40,000 cubic yards of waste rock and about 80,000 cubic yards tailings will be removed. To accommodate haul traffic there will be widening of routes up to no more than 12 feet, grading, and turnouts installed. Culverts will be replaced or upgraded. The intersection of FS 1855 & BLM 504 will be upgraded to a 100 year-flow culvert. Reconstruction of pond & drainages w/ re-vegetation along w/ either a road closure of BLM 504 or a jackleg fence will be place to deter off-road, motorized recreational use.

Table B3. Reasonably Foreseeable Activities

Project/Activity Name	Decision Date and/or Status	Brief Description
Blackfoot-North Divide Winter Travel Planning	Estimated Implementation 2012	The HNF is proposing changes to the existing roads and trail systems on National Forest System lands in the Blackfoot-North Divide planning area. This plan will provide for a variety of motorized and non-motorized winter recreation opportunities.
Golden Anchor Road	Foreseeable	Aquatic Organism Passage Legacy Road: Road 4100 construct a 60' span spill thru bridge over the existing ford on the Little Blackfoot River
Rimini County Road Hazard Tree Removal	Foreseeable	This project would remove hazard trees located along the Tenmile Road that accesses Rimini. Project parameters are similar to those of the Forest-wide Hazard Tree Removal Project. This project was separated out from that larger effort because of its location along a County road
Ten Mile Road Improvement Project (County Route 695) also known as Rimini Road.	Foreseeable	Improve road way from the junction with Hwy 12 to the junction with the Chessman Reservoir intersection, just over 6 miles in length. Improvements would include replacement of three bridges and associated railings, bridge drainage improvements, upgrading road signs, re-alignment of road segments, and paving.
Telegraph Creek MPB Salvage and Precommercial Thinning	Foreseeable	Approximately 6,335 acres are proposed for treatment. About 1,867 acres would be pre-commercial thinned (15-40 year old stands). The remaining acres are mature stands with high MPB mortality, which would be treated with chainsaws, prescribed fire, masticators, feller-bunchers, and cable logging equipment. Primary prescription would be regeneration harvest. About 7 miles on new roads and 5 miles of reconstructed roads are needed. Post treatment may include about 3,800 acres of underburn, site prep burn, broadcast burn, jackpot burn, and hand pile & burn.

APPENDIX C. ADDITIONAL WILDLIFE INFORMATION

Introduction

Appendix C provides additional information that may benefit the reader in further understanding the effects of the Divide Project on wildlife. Three appendices from the Wildlife Specialists Report have been pulled into this appendix. From the specialists report, they include Appendix A Wildlife Analysis Approach, Appendix D Species of Concern, and Appendix E the Summary of Effects. The complete wildlife specialists report and all its appendices can be found in the project record.

Wildlife Analysis Approach

The following six tables (C.1 through C.6) describe how each wildlife parameter is addressed. Some of the parameters have been described in the main body of the in the Wildlife Report, while others are either assumed to be unaffected by travel management or are assumed to be addressed under other parameters. The table, below, provides the rationale for the level of analysis applied to each wildlife parameter.

Table C.1 General Habitat and Rationale for Analysis

Wildlife Parameter	Discussion: Rationale for Analysis
Fragmentation	The Continental Divide region of the Helena NF is an inherently fragmented landscape of alternating grasslands and forest with riparian areas serving as focal habitats. These patterns are constantly shifting as a result of natural processes and human enterprisies: natural succession, fire, insect outbreaks, climate shifts, timber harvest, livestock grazing, human settlement, water diversion and impoundment, road building. Roads are one component that can fragment the landscape for certain species and alter patterns of habitat use, movement, and general behavior patterns for many others. The character and intensity of road impacts will depend on the species in question, the nature of local habitats, and the kinds of roads involved. Roads generally have less of a fragmentation effect on species with larger home ranges and more mobility. Diminutive species with small home ranges and limited mobility generally are more susceptible to fragmentation effects created by roads. Traffic volume on any segment of the road system is key to its influence on habitat effectiveness. The Wildlife Specialist Report addresses fragmentation and the potential effects of proposed road closures
Habitat Loss	The presence of roads on the landscape amounts to a direct loss of wildlife habitat. Although a majority of Forest roads are narrow (often 12 feet or less), and the sinuous strips of the ground they occupy represent a relatively minor depletion of habitat, others are broad and flanked by roadside environments in which original habitat is substantially altered. Even where roads have been closed to all

Wildlife Parameter	Discussion: Rationale for Analysis
	motorized uses, functional habitat is usually slow to return, given the hard-packed substrate and frequent use of roadbeds as travelways by wildlife, livestock, and humans on foot. Roads also provide access for firewood gathering, which results in a loss of habitat for species that use woody debris or snags for any portion of their life cycle. Roads provide avenues for spread of exotic species—most often noxious weeds—that may eventually result in loss of productive habitat. These topics are discussed in the Wildlife Specialist Report.
Edge Effects	Roads produce edge effects. Edge effects may extend up to 200 meters into a forest for a major road with a broad, cleared corridor, altering biological communities and ecological processes throughout that zone. In other cases, primitive roads may be so enveloped by surrounding forest or grassland that edge effects are virtually non-existent. For more ample roadways in forest environments, edge zones tend to be drier and less shady than interior forests and tend to favor shade-intolerant plants. Edge-adapted species (including many terrestrial game species) benefit from increases in edge whereas species dependent on true interior habitat may be unable to maintain their populations in landscapes where edge is abundant. The Wildlife Specialist Report discusses edge effects in terms of current conditions and the evolution of edges in road corridors closed to motorized uses.
Riparian Habitats	Riparian habitats have been altered from historic conditions by mining, livestock grazing, road construction, stream diversion and impoundment, and decline of beaver. These are habitats that, because of their elevated levels of productivity and biotic diversity, tend to focus wildlife activity regardless of surrounding habitat structure. Forested riparian sites amidst surrounding grassland/shrubland supply cover and food for a variety of resident species (as well as for migrating birds in the fall) and they serve as movement corridors for forest species. Riparian habitats are important also as reproductive areas for amphibians. Many roads follow stream corridors, resulting in direct loss of habitat, stream sedimentation, and displacement of wildlife species. As well, streams are often desirable places to camp, leading to trampling of vegetation, soil compaction, and disruption of local wildlife habitat use. The Wildlife Specialist Report addresses effects on riparian habitats.
Dispersal, Habitat Linkage, and Movement across the Landscape	The Divide has always been an inherently fragmented landscape of alternating grasslands, forests, and local riparian sites. Historically, however, habitats were sufficiently linked by direct connection or proximity that species specialized for one habitat or another (marten or goshawks, for example) were able to move across the landscape. Shifts in habitat patch size and connectivity were generated by fire, insect outbreaks, and other natural phenomena. Since the 1860's, mining, roads, and other long-term human-generated features on the landscape have created rigid movement barriers and impacted riparian

Wildlife Parameter	Discussion: Rationale for Analysis
	areas. These features have reduced the size of habitat patches in which wildlife species are able to operate free from human interference and impeded the ability of a number of species to move through the landscape. The role of roads and trails in this process is analyzed in the Wildlife Specialist Report.
Snags and Logs	Until recently, large snags and logs have been relatively uncommon over much of the Divide landscape because of the relatively young/middle-aged forest structure (80-120 years old) produced by widespread logging and fires in the late 19th and early 20th centuries. Exceptions have been in pockets of advanced mature and old-growth forest unaffected by historic fire and logging, a few drainagers subject to winter kill in the late 1980's (Jericho Mtn, upper Snowshoe Crk), and a couple relatively recent mid-sized fires (Breatrap, MacDonald Pass). Numbers of snags and logs have now increased dramatically across the Travel Plan Area as a result of the mountain pine beetle epidemic. Most mortality is occurring in mature lodgeople and ponderosa pine, but whitebark and limber pine are affected as well. The Wildlife Specialist Report addresses this topic.
Noxious Weeds	Noxious weeds impact wildlife by reducing habitat availability where the weeds successfully out compete native vegetation. The Noxious Weeds Section in the *EIS* analyzes the effects of the various Alternatives on noxious weeds. Weeds are discussed in the Wildlife Specialist Report only as they relate tangentially to other habitat components and processes (elk winter range, ATV off-trail use, livestock grazing, etc.).
Unique Features	Several wildlife species utilize unique features such as cliffs, caves, and talus slopes. These features are not analyzed as a separate topic in the Wildlife Specialist Report. Rather, they are discussed in accounts of the species that utilize them—as in wolverine denning habitat, for example.

Table C.2 Big Game and Rationale for Analysis

Wildlife Parameter	Discussion: Rationale for Analysis
Elk	The elk is a key species on the HNF—as an object of public fascination and scrutiny and as a management indicator for other big game species that depend on the same diverse habitat spectrum. Elk make use of a variety of habitats and habitat components, and voluminous research into their use of the landscape provides insights into habitat used by numerous other species. The *Forest Plan* identifies the components of elk habitat that need to be addressed with regard to travel planning—namely, open road patterns during the hunting season; hiding cover on summer range; thermal cover, roads, and snowmobile routes on winter range. Thermal and hiding cover are not

	key elements of this analysis, which focuses on the influence of motorized routes. Elk are known to respond to road density on summer range (not a Forest Plan standard) and to the distribution pattern of open roads that provide hunter access in the fall (which is a Forest Plan standard). These aspects are addressed by habitat effectiveness and elk security area analyses. Elk and elk habitat are dissected at length in the Wildlife Specialist Report and this analysis is carried forward into the *EIS*. Additional discussion applicable to elk can be found throughout the Specialist Report, in particular in sections on *Connectivity and Fragmentation* and *Key Local Areas.* Elk population parameters are measured annually by MFWP via winter range aerial cenuses, hunter check stations, hunter surveys, and a variety of field studies.
Mule Deer	The mule deer is an adaptable and resilient species. In recent decades population numbers have moved up and down in roughly 20 year cycles. Low points occurred in the 1970s and mid 1990s, and as of early 2014, populations are once again in decline throughout much of Montana. Nonetheless, mule deer remain widespread and common in the Divide landscape and adjacent non-Forest lands. Because of shifting abundances in the mule deer population, it behooves the Helena NF to monitor and manage mule deer habitat with some attention to detail. These efforts compliment population monitoring by MFWP. Like elk, mule deer serve as a *Forest Plan* indicator for big game habitat. Aside from this designation, however, the *Forest Plan* provides little specific management direction for deer. The *Plan* assumes that management for elk will take care of the needs of deer. While mule deer exhibit behavior and habitat use patterns somewhat different from those of elk, many basic habitat components (productive foraging areas, hiding cover, riparian sites, road density, and areas free from human disturbance) are important to both. Consequently, effects analyses for elk are assumed to be valid for elucidating potential effects of Travel Plan alternatives on mule deer as well. These analyses, along with additional discussion relevant to mule deer, are presented in the Wildlife Specialist Report.
Moose	The Shiras moose is native to Montana, although it now appears to inhabit many areas where it was not observed in the 19th century. As of the 1990s moose had moved as far south as northern Utah and Colorado. Lately, moose populations have been receding noticeably in parts of Montana (and elsewhere across the country). Moose are found throughout the Divide landscape, but they are uncommon—a function of their solitary nature coupled with spotty distribution of key habitat around which they focus their activity. Although they move through nearly all types of mountainous habitats, moose seek out productive riparian and subirrigated habitats as foraging sites and spend a large portion of their time there. They will feed on submerged aquatic plants and tall forbs in summer but, above

	all, they are browsers on tall and mid-sized shrubs. The *Forest Plan* addresses the importance of riparian shrub communities to moose and directs that these habitats be monitored and preserved. There are, however, no anticipated effects on the quantity or diversity of browse available to moose as a result of actions proposed by Travel Plan alternatives. Primary effects of travel management arise from the susceptibility of moose to poaching or accidental shooting because of the tendency of many individuals to select foraging sites without regard to the presence of open roads. Discussion of site-specific effects of travel routes on riparian habitat and vulnerability of elk to hunting apply to moose as well.
Bighorn Sheep	Bighorn sheep have not been identified as resident in the Divide landscape since the early 20th century. The wild sheep fell victim to early market and subsistence hunting and to disease introduced with dometic sheep. MFWP currently has no plans for reintroduction of bighorn sheep in this area. Consequently, they will not be analyzed further for this project.
Whitetail Deer	As with mule deer, white-tailed deer population numbers tend to cycle periodically; and as with mule deer, their populations are currently in decline in much of the state. A large percentage of whitetail habitat is at lower elevation in riparian areas and valleylands, and thus these deer are much less common on the National Forest than mule deer. Analyses of Elk, Mule Deer, and Riparian Habitats serve as surrogates for effects of travel management on whitetail deer.
Other Hunted and Trapped Species	Mountain lion and black bear hunting are unique enterprises, each of which requires an individual approach different from what works for elk and deer. But in the end, these species are affected by the Forest road and trail network in much the same way as are elk—and the analysis of roads for elk security applies to them as well. See also, the discussion of grizzly bears, road density, and unroaded habitat enclaves. For a discussion of the interrelationship of motor routes and trapping, see the sections pertaining to forest carnivores—specifically, wolverine, fisher, and marten.

Table C.3 Threatened, Endangered, and Proposed Species and Rationale for Analysis

Wildlife Parameter	Discussion: Rationale for Analysis
Grizzly Bear	In 2002, the northern half of the Divide landscape (and the Travel Plan Area) was classified as a "Grizzly Bear Distribution Zone"—a region outside of the NCDE Recovery Zone in which grizzlies were known to be consistently present. In 2013, the southern half of the landscape was added to the Distribution Zone as well. The resident grizzly bear population in the Distribution Zone appears to be very small, and the bears are seldom observed. The USFWS feels that the primary management elements with potential to adversely impact grizzlies in the Distribution Zone are livestock grazing, sanitation (trash, food storage), and human access management. Of these, access manaement is directly relevant to travel planning. With regard to access management, the Helena NF gauges effects on grizzly bears throughout this area according to the *Interagency Grizzly Bear Committee (IGBC) Guidelines* (1986). We have used *IGBC* "Management Situation 5" as the most appropriate guide and have focused on the linkage zone function of the Divide landscape. To this end, we have looked at open road densities and the size and distribution of unroaded habitat refugia (areas larger than 2,500 acres with all boundaries more than 0.3 miles from open roads or motor trails) to estimate the relative impacts of alternatives.
Canada Lynx	Effects on lynx are assessed according to standards and guidelines in the *Northern Rockies Lynx Management Direction (NRLMD)* (2007)—now a part of the *Forest Plan*. Of the 8 guidelines and standards that deal with roads and motor trails, only two are relevant to Travel Plan alternatives, since no new roads or trails are proposed. The applicable guidelines address snowmobile routes and the potential for creating access trails for lynx competitors through snow compaction. The assessment thus concerns itself primarily with the mileage and distribution of snowmobile routes under different alternatives and with the potential for snowmobile play areas in lynx habitat. The *NRLMD* does not address open road densities or the size and distribution of unroaded habitat refugia in a quantitative manner with regard to lynx. So while I have taken these factors into account, I have done so only by refering to quantitative assessments in sections for Grizzly Bears, Elk, and Connectivity.

Table C.4 Sensitive Species and Rationale for Analysis

Wildlife Parameter	Discussion: Rationale for Analysis
Wolf	Wolf packs have occupied the Divide landscape and areas adjacent to it in the valleys and foothills since 1995: 5 packs are known to have been present in this area at one time or another between 1995 and 2007. All new packs that have formed within reach of the Travel Plan Area over the past 5 years have been removed or greatly reduced by USDA Wildlife Services because of their propensity for preying on domestic livestock. A number of wolves have been observed in or near the Plan Area in the last couple years (2010-2012), but evidence of pack formation has been inconclusive. The USFWS and MFWP have monitored all of the known Divide packs intensively, and the movements and actions of these wolves have been well documented. HNF biologists have followed their presence on National Forest lands, particularly with regard to their activity on grazing allotments. In this analysis, potential effects of travel planning on wolves are assessed in terms of parameters outlined in the *Wolf Recovery Plan* (1987) and the *Montana Wolf Conservation and Management Plan* (2003): Road density, unroaded habitat blocks, and the potential for human disturbance of denning and rendezvous sites.
Wolverine	Wolverines are known to be present in the Travel Plan Area as a result of systematic tracking and DNA analysis conducted over the last 5 years—as well as from earlier observations and tracking surveys. In early 2013, the USFWS proposed listing the wolverine as a *threatened species* under the Endangered Species Act. Reasons for listing have to do with methodical shrinking of snowpack in high elevation basins where wolverines establish natal dens. Related to this, human access to these areas via snowmobile and all-terrain vehicles in winter or early spring could disturb dening female wolverines and young at these key sites. Roads and trails (especially snowmobile trails) increase vulnerability of local wolverine populations by reducing the scope of suitable habitat and increasing the chance of negative encounters with humans. The size of roadless refuges and the extent to which snowmobile routes probe into potential wolverine natal denning areas are used to gauge impacts. The analysis is presented in the main body of the Widlife Report.
Fisher	Fisher are possibly probably present in the Plan Area - though in very low numbers. Impacts are measured in terms of open road density in modeled fisher habitat—both as an indicator of access available to trappers on snowmobiles in winter and the area from which firewood cutters can remove large snags (important habitat components for fishers). The analysis is presented in the main body of the Wildlife Report.

Wildlife Parameter	Discussion: Rationale for Analysis
Black-backed Woodpecker	There has been little habitat capable of sustaining viable black-backed woodpecker populations in the Divide landscape in the past century. The last large fires that created an abundance of suitable dead-tree habitat occurred in the late 19th and early 20th centuries. The MacDonald Pass fire in 2009 and the Beartrap Gulch fire in the 1960's created a few hundred acres of local habitat, but these were isolated events. Blackbacked woodpeckers were reported in the MacDonald Pass burn in 2010 and 2011. Ongoing bark beetle infestations are creating an abundance of dead tree habitat all across the landscape. But, while this plethora of new snags is proving to be a boon for several woodpecker species (hairy, downy, pileated, flickers) it does not appear to be attracting black-backed woodpeckers as would fire-generated snag arrays. Any effects of travel management will be indirect and are measured in terms of roadside corridor available to firewood cutters. The analysis is presented in the main body of the Wildlife Report.
Western Boreal Toad	Recreational impacts, including road and trail development and OHV use, affect western toads to some degree. Certain roads may serve as travel impediments, and the toads are more susceptible to mortality from vehicles than are most mammals and birds. While western toads range through a variety of upland habitats, they concentrate around riparian/aquatic breeding sites. Potential effects, therefore, are assessed primarily in terms of road miles in Riparian Habitat Conservation Areas. This analysis is presented in the main body of the Wildlife Report.
Peregrine Falcon	Falcon eyries are located on high cliffs, often near water. Peregrine falcons were extirpated from the Divide landscape in the mid 20th century, and no new occupied eyries have been located in the landscape since the falcons have become re-established in and around the HNF (almost entirely in the Big Belt Range) in the early 1990's. No quantitative analysis is needed at this point.
Bald Eagle	No active bald eagle nests have been located on HNF lands in the Divide landscape since the rejuvenation of local eagle populations over the last 3 decades. All known nests near the landscape are in the Little Blackfoot drainage on private land to the west. Most resident eagles on the Forest have located along the Missouri River in the Big Belt range and along the Big Blackfoot River. No quantitative analysis has been done here.

Wildlife Parameter	Discussion: Rationale for Analysis
Flammulated Owl	Flammulated owls utilize open park-like conifer forests, especially ponderosa pine. They require an adequate forage base of large insects and a large snag component. Potential habitat does exist in the Divide landscape, and the birds are known to be present—primarily along the Mount Helena Ridge outside the Travel Plan Area. Effects on these owls are assessed qualitatively in terms of the likelihood of snag removal along roads by firewood cutters in modeled flammulated owl habitat. This discussion is presented in the main body of the Wildlife Report.
Townsend's Big-eared Bat	Key components for these bats are caves, mine openings, and a variety of smaller rock cavities. There is a possibility that they are present in the Divide landscape, but none have been found to date. The potential for any of the proposed Travel Plan alternatives generating effects relevant to big-eared bats is scant, and so they are not analyzed in the Wildlife Report.
Northern Leopard Frog	Leopard frogs have not been found near the Divide landscape since the early 1990's, and it is likely that they have been extirpated from the area. The analysis of roads in riparian areas done for the western toad will suffice to quantify any potential impacts on leopard frogs.
Harlequin Duck	Harlequin ducks have never been identified on the Helena NF in the Divide landscape, although they have been reported, rarely, in transit further west on the lower Little Blackfoot River. No analysis was done for harlequin ducks.
Northern Bog Lemming	The northern bog lemming has not been identified in the Divide landscape, nor has any viable habitat been identified. Analyses addressing riparian habitats and other riparian-dependent species will suffice for this species.
Columbia Sharp-tailed Grouse	The Columbian sharp-tailed grouse is not present in the Plan Area and was not analyzed.

Table C.5 Management Indicator Species and Rationale for Analysis

Wildlife Parameter	Discussion: Rationale for Analysis
Pileated Woodpecker	The pileated woodpecker is identified as an old growth-dependent MIS in the *Forest Plan*. Throughout the Divide landscape, however, pileated woodpeckers are usually found in non-old-growth habitat, with large nesting trees (>30" dbh) being the key habitat component. Availability of insect-prone feeding substrate (typically dead or dying trees) is also important. Observation of pileated woodpeckers is usually fortuitous. The location of observations (of the woodpeckers, by sight or sound, and of their characteristic excavations in trees) are noted and mapped. Observations of pileated woodpeckers are increasing in the Divide landscape as dead trees produced by the mountain pine beetle outbreak continue to proliferate. Pileated woodpecker habitat is analyzed in the main body of the Wildlife Report.
Northern Goshawk	The goshawk is designated as an old-growth indicator, although it is more often found in non-old-growth habitats on the HNF. Goshawks maintain large home ranges and make use of a variety of habitats within them. They are most commonly associated with mature forested habitats and require dense mature forest for nesting and successfully fledging young. There are a number of known nest sites and territories within the project area. Motorized and non-motorized use can affect nesting goshawks if the activity is too close to a nest site. Known goshawk nesting teritories are monitored in the field each year, and active nests are checked as many times as needed to determine nesting success. New territories are monitored whenever they are identified. Because goshawks move to new nest sites each year, not all active nests are able to be located in a given year, but the presence of goshawks on the territory can usually be verified. The ongoing mountain pine beetle outbreak is dramatically affecting the configuration of goshawk habitat within the Plan Area (and across the HNF as a whole). The goshawk is analyzed further in the main body of the Wildlife Report.
Hairy Woodpecker	The hairy woodpecker is identified as a snag dependent MIS in the Forest Plan. Hairy woodpeckers are relatively common throughout a variety of habitats in the project area, and their numbers are increasing noticeably in forest stands killed by the mountain pine beetles. They are further analyzed in the main body of the Wildlife Report.

Wildlife Parameter	Discussion: Rationale for Analysis
Marten	The marten is an indicator for the quality of large continuous blocks of mature cover. Marten use mature/ old-growth spruce/fir and lodgepole pine stands for denning, with stumps and downed logs being critical components. Fragmentation of coniferous cover through historical and recent logging and roading has reduced habitat suitability, and trapping has reduced marten numbers directly. Ongoing bark beetle infestation may have mixed implications for marten—increasing the availability of large snags and logs but reducing the availability of mature forest overstory. Effects of travel management on marten are analyzed in the main text of the Wildlife Report. The primary habitat parameter is the availability of mature forest with abundant coarse woody debris. Field observation of marten comes from winter tracking surveys, observation during general wildlife surveys, and annual survey work by MFWP.
Hunted Species Group	The hunted species group is summarized above under *Big Game*.
Threatened and Endangered Species Group	Part of this group is covered in the section on *Sensitive Species* (bald eagle, peregrine falcon, wolf) and the remainder (grizzly bear) under *Threatened and Endangered Species* above.

Table C.6 Other Road Analysis Issues and Rationale for Analysis

Wildlife Parameter	Discussion: Rationale for Analysis
Recreation	Effects of recreation that are facilitated by road and trail use are described in the Wildlife Specialist Report under the respective species for which effects may be relevant.
Disruption/ Displacement	Disruption and displacement associated with road and trail use are described in the Wildlife Specialist Report under the respective species for which effects may be present.
Direct Mortality	Direct mortality associated with roads is described in the Wildlife Specialist Report under the respective species for which effects may be present.

Species of Concern

Status of Species of Concern Known or Suspected to be Present in the Divide Landscape of the Helena National Forest

Species of Concern known or suspected to be present in the Divide landscape of the Helena National Forest include Threatened, Endangered, and Proposed Species (Endangered Species Act); Sensitive

Species (Forest Service Region 1); and Species of Concern (MT Natural Heritage Program; MT Fish, Wildlife and Parks). The list is current as of May 2009.

Table C.7 Species of Concern

Species	USFS Northern Region Listing[1]	MNHP State Ranking[2]	MFWP Species of Concern	Status in the Divide Landscape[3]
Mammals				
Grizzly Bear	threatened	S3	listed	Resident and transient in the Divide landscape in very low numbers
Canada Lynx	threatened	S3	listed	Transient and apparently resident in the Divide landscape in very low numbers
Gray Wolf	sensitive	S3	listed	Transient and sporadically resident across the landscape in relatively low numbers
Fisher	sensitive	S3	listed	Rarely observed: status in the Divide landscape unknown
Wolverine	sensitive	S3	listed	Transient and resident in the Divide landscape, but rare
Northern Bog Lemming	sensitive	S2	listed	Presence suspected in the Divide landscape: not yet identified on the HNF
Townsends Big-eared Bat	sensitive	S2	listed	Presence suspected in the Divide landscape: not yet identified on the HNF
Black-tailed Prairie Dog	-	S3	-	Not known on the HNF: local populations on adjacent lands are highly fragmented
Hoary Bat	-	S3	-	Not identified on the HNF: suspected on adjacent lands

[1] The 2 threatened species are listed as such by the USFWS under the Endangered Species Act. USFS Region 1 follows suit in its classification of these species.

[2] MT Natural Heritage Program State Rankings. **S1** = *At high risk* because of *extremely limited* and potentially declining numbers and/or distribution, making it *highly vulnerable* to extirpation; **S2** = *At risk* because of *very limited* and potentially declining numbers and/or distribution, making it *vulnerable* to extirpation; **S3** = *Potentially at risk* because of limited and potentially declining numbers and/or distribution, even though it may be abundant in some areas; **S5** = Common, widespread, and abundant—not vulnerable in most of its range. **"B"** denotes breeding populations, **"N"** non-breeding (wintering) populations.

[3] Information on species distribution in the Divide landscape has come from Skaar 2003 (Montana Bird Distribution), Foresman 2001 (The Wild Mammals of Montana), Werner *et al.* 2004 (Amphibians and Reptiles of Montana), the Montana Heritage tracker (http://mtnhp.org/tracker), and Helena National Forest field observation records.

Species	USFS Northern Region Listing[1]	MNHP State Ranking[2]	MFWP Species of Concern	Status in the Divide Landscape[3]
Preble's Shrew	-	S3	listed	Presence suspected: not yet identified on the HNF
Birds				
Peregrine Falcon	sensitive	S2B	listed	Transient: no known eyries in the Divide landscape
Bald Eagle	sensitive	S3	listed	Nests rare in the Divide landscape: all on private land.
Black-backed Woodpecker	sensitive	S2	listed	Resident on the HNF: population numbers highly variable over time
Flammulated Owl	sensitive	S3B	listed	Resident in the Divide landscape in low numbers
Harlequin Duck	sensitive	S2B	listed	Not detected on the HNF: rare seasonal migrant in adjacent areas
Loggerhead Shrike	sensitive	S3B	listed	Not detected on the HNF: rarely observed on adjacent lands
Baird's Sparrow	sensitive	S2B	listed	Rare seasonal migrant
Long-billed Curlew	sensitive	S2B	listed	Not detected on the HNF: uncommon on adjacent lands
Pileated Woodpecker	indicator species	S3	-	Resident in Divide forests with a large tree component, but uncommon
Ferruginous Hawk	-	S3B	listed	Uncommon seasonal migrant
Swainson's Hawk	-	S3B	listed	Resident in low numbers
Northern Goshawk	indicator species	S3	listed	Widespread resident across the Divide landscape: numbers inherently low
Brown Creeper	-	S3	-	Widespread but relatively uncommon in mature forests across the landscape
Cassin's Finch	-	S3	-	Relatively common in the Divide landscape and adjacent lands
Veery	-	S3B	-	Resident and fairly common in riparian shrub habitats
Black Rosy-Finch	-	S2	listed	Winter resident/transient
Gray-Crowned Rosy-Finch	-	S5N	listed	Winter resident/transient
Mountain Plover	-	S2B	listed	Not reported on the HNF: breeding in adjacent areas in very low numbers

Species	USFS Northern Region Listing[1]	MNHP State Ranking[2]	MFWP Species of Concern	Status in the Divide Landscape[3]
Great Blue Heron	-	S3	-	Resident and often observed: suitable aquatic habitat is highly localized
Bobolink	-	S2B	listed	May be present on the HNF: breeding in adjacent areas in low numbers
Lewis's Woodpecker	-	S2B	listed	Present in the Divide landscape in low numbers
Clark's Nutcracker	-	S3	-	Relatively common in the Divide landscape
Brewer's Sparrow	-	S2B	listed	Resident in the Divide landscape in low numbers
Great Gray Owl	-	S3	listed	Uncommon but widespread on the HNF and in the Divide landscape
Golden Eagle	-	S3	-	Resident and transient: numbers inherently low
Amphibians				
Western Toad	sensitive	S2	listed	Relatively common in the Divide landscape: local populations fragmented
Northern Leopard Frog	sensitive	S1	listed	Extirpated: not observed on the HNF or adjacent lands in nearly 2 decades
Plains Spadefoot	sensitive	S3	listed	Not present in the Divide landscape or adjacent lands
Reptiles				
none	-	-	-	No reptiles of concern are present in the Divide landscape

Summary of Effects

The following table summarizes the effects of each alternative on the different wildlife components.

Table C.8 Summary of Effects on Wildlife Components

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
Potential for Human Disturbance	Potential for motorized disturbance would remain as it is now along 432 miles of open road & 35 miles of motor trail.	Levels of motorized disturbance would decrease in some areas and increase in others. Overall, the open road system would decline from 432 to 429 miles, system motor trails from 35 to 26 miles.	Redistribution of disturbance to new areas would be minimal. Overall, the open road system would decline from 432 to 391 miles; all system motor trails would be eliminated.	Overall, effects would be similar to Alternative 3. The open road system would decline from 432 to 399 miles, system motor trails from 35 to 4 miles.
Habitat Loss	Habitat lost to previous road construction would remain as it is now. Assuming an average roadbed width of 16 ft & average motor trail width of 4 ft, this amounts to roughly 855 acres (or 0.5% of the Planning Area) usurped by open roads & motor trails.	Alternative 2 would remove 12 miles of open road & motor trail. Some of the newly closed road prisms would remain intact; others would be recontoured, thus restoring habitat. The decrease amounts to roughly 10 acres of potential habitat—too small an increment to measurably benefit local wildlife populations.	Alternative 3 would eliminate 76 miles of open road & motor trail. As in Alternative 2, some closed road prisms would remain intact, others would be recontoured. Potential habitat would increase by about 97 acres—an improvement from a wildlife perspective but not enough to measurably augment local wildlife populations.	Alternative 4 would generate effects similar to those of Alternative 3, eliminating 64 miles of open road & motor trail. Some of the newly closed roads would be recontoured, others left alone. Potential habitat would increase by about 79 acres—too small an increment to measurably boost local wildlife populations.
Edge Effects	No new road corridors would be created and edge effects associated with roads would remain as they are now—generally modest, influencing habitat use patterns of a few small mammals and forest birds.	Although 3 fewer miles of road would remain open, the road corridors and their associated edge effects would remain intact for many years—as in Alternative 1.	Although 41 fewer miles of road would remain open, the road corridors and their associated edge effects would remain intact for many years—as in Alternative 1.	Although 32 fewer miles of road would remain open, the road corridors and their associated edge effects would remain intact for many years—as in Alternative 1.

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
Riparian Habitat	The 83 miles of road currently open to motorized use in Riparian Habitat Conservation Areas (RHCA's) would remain as such.	Roads open to motorized use in RHCA's would decline to 76 miles, resulting in less displacement of wildlife from these key habitats.	Roads open to motorized use in RHCA's would decline to 69 miles, resulting in less displacement of wildlife from these key habitats.	Roads open to motorized use in RHCA's would decline to 70 miles, resulting in less displacement of wildlife from these key habitats.
Connectivity and Fragmentation	Weighted open road density would remain unchanged at 0.8 mi/mi². Acreage of large non-motorized habitat patches (>1,500 acres) would remain unchanged at 113,325 acres (64% of all land in the Travel Plan Area).	Weighted open road density would remain about 0.8 mi/mi². Total acreage of large non-motorized habitat patches would decrease slightly to 111,905 acres (63% of land in all ownerships in the Planning Area). Implications for wildlife would be highly localized and insubstantial.	Weighted open road density would remain at about 0.8 mi/mi². Total acreage of large non-motorized habitat patches would increase to 121,330 acres (68% of land in all ownerships in the Planning Area). This would improve potential for unimpeded wildlife movement in some localities.	Weighted open road density would decline slightly to 0.7 mi/mi². Total acreage of large non-motorized habitat patches would increase to 121,195 acres (66% of land in all ownerships in the Planning Area). Benefits for wildlife habitat connectivity would be similar to those in Alternative 3.
Snags and Woody Debris	Approx. 294 miles of road corridor would remain open to snag removal by firewood cutters. Within a 600 ft road corridor this amounts to 21,300 acres (15% of mature forest in the Travel Plan Area).	Road corridor open to potential snag removal by firewood cutters would decline to 260 miles in mature forest habitat. Within a 600 ft road corridor this amounts to 18,900 acres (13% of mature forest in the Plan Area).	Road corridor open to potential snag removal by firewood cutters would decline to 233 miles in mature forest habitat. Within a 600 ft road corridor this amounts to 16,970 acres (12% of mature forest in the Plan Area).	Road corridor open to potential snag removal by firewood cutters would decline to 235 miles in mature forest habitat. Within a 600 ft road corridor this amounts to 17,091 acres—slightly more than in Alternative 3.
Elk: Summer Range Habitat Effectiveness	Elk summer range habitat effectiveness would remain at 72% in the Planning area as a whole. It would remain above the recommended 50% level in all 6 Divide herd units: The availability of summer habitat in general would not be a limiting factor, although key	Overall habitat effectiveness would remain at 72% in the Planning Area. It would increase in 3 herd units, decline in one, and remain unchanged in two. All herd units would remain above the recommended 50% level. Local availability of key summer habitat would increase	Overall habitat effectiveness would increase to 74% in the Planning Area. It would increase in 4 herd units and remain unchanged in two. All herd units would remain above the recommended 50% level. Local availability of key summer habitat sites would increase in a	Overall habitat effectiveness would increase to 73% in the Planning Area. It would increase in 3 herd units and remain unchanged in three. All herd units would remain above the recommended 50% level. Local availability of key summer habitats would increase in

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	habitat sites would continue to be compromised In a number of local areas.	in some areas and decrease in others.	number of areas.	several sites and decline in one area.
Elk: Hunting Season Security	Elk security areas would continue to occupy 77,232 acres (33% of hunting season home range) on the HNF. Of 6 herd units, four would continue to remain at or above the recommended 30% of fall range & two would remain well below. Technically, all herd units would comply with the amended *HFP* big game security standard—although the 2 units below 30% would not improve.	Elk security areas would increase to 79,350 acres (34% of fall home range) within HNF boundaries. Of the 6 herd units, three would remain above the recommended 30% of fall range, one would improve but remain below 30%, one previously sub-standard unit would rise above 30%, and one unit, currently at 30%, would drop well below that level. This latter unit would no longer comply with the *HFP* amended big game security standard.	Elk security areas would increase to 88,335 acres (38% of hunting season home range) within HNF boundaries. Of the 6 herd units, four would remain above the recommended 30% of fall range, one previously sub-standard unit would rise above 30%, and one unit would improve but remain below 30%. All herd units would comply with the amended *HFP* big game security standard, including the one remaining below the 30% threshold at 29%.	Elk security would be similar to that in Alternative 3. Security areas would increase to 87,519 acres (38% of hunting season home range) on the HNF. As with Alternative 3, 4 herd units would remain above the recommended 30% of fall range, one previously sub-standard unit would rise above 30%, and one unit would remain below 30%, although its security would improve. All herd units would comply with the amended *HFP* big game security standard.
Elk: Winter Range	Alternative 1 has no influence on thermal cover. It would retain approx. 12,000 acres of off-route snowmobile restrictions on big game winter range (as defined by the Oil & Gas EIS winter range map).	Alternative 2 would not influence thermal cover. It includes approx. 25,500 acres of off-route snowmobile restrictions on Oil & Gas EIS big game winter range. It would close 12.5 miles of winter range motor routes in Sweeney Crk. and open 5 miles of new routes in upper Spotted Dog Crk.	Alternative 3 would not affect thermal cover. Like Alt. 2, it includes approx. 25,500 acres of off-route snowmobile restrictions on Oil & Gas EIS big game winter range. It includes the same 12.5 miles of new motor route closures in Sweeney Crk. as Alt. 2, but would not open any new routes in Spotted Dog Crk.	Alternative 4 would not affect thermal cover. Like Alts. 2 & 3, it includes approx. 25,500 acres of off-route snowmobile restrictions on Oil & Gas EIS big game winter range. It includes the same 12.5 miles of new motor route closures in Sweeney Crk. as Alternative 2, but would not open any new routes in Spotted Dog Crk.
Mule Deer	The relative impacts on mule deer would be similar to the impacts that Alternative 1	The relative impacts of Alternative 2 on mule deer would be similar to those that it	The relative impacts of Alternative 3 on mule deer would be similar to those that it	The relative impacts of Alternative 4 on mule deer would be similar to those that it

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	would have on elk and elk habitat—greater than all 3 action alternatives (see previous 4 components).	would have on elk and elk habitat—less than Alt. 1, greater than Alts. 3 & 4 (see previous 4 components).	would have on elk and elk habitat—less than Alts. 1 & 2, similar to Alt. 4 (see previous 4 components).	would have on elk and elk habitat—less than Alts. 1 & 2, similar to Alt. 4 (see previous 4 components).
Grizzly Bear	Alternative 1 would retain 8 large unroaded core habitat areas (>2,500 acres) averaging about 6,800 acres each (31% of the Plan Area). Unweighted open motor route density would remain at 2.6 mi/mi² in the northern Distribution Zone and 1.4 mi/mi² in the southern Zone. The alternative complies with the *Grizzly Bear Recovery Plan* and with management guidance for bears outside recovery zones.	Alternative 2 would maintain 6 large unroaded core habitat areas (>2,500 acres) averaging about 9,200 acres each (31% of the Plan Area). Open motor route density would be 2.4 mi/mi² in the northern distribution zone and 1.6 mi/mi² in the southern zone. The alternative would comply with the *Grizzly Bear Recovery Plan* and with management guidance for bears outside recovery zones.	Alternative 3 would maintain 7 large unroaded core habitat areas (>2,500 acres) averaging about 10,349 acres each (41% of the Plan Area). Open motor route density would be 2.3 mi/mi² in the northern distribution zone and 1.1 mi/mi² in the southern zone. The alternative would comply with the *Grizzly Bear Recovery Plan* and with management guidance for bears outside recovery zones.	Alternative 4 would maintain 8 large unroaded core habitat areas (>2,500 acres) averaging about 8,795 acres each (40% of the Plan Area). Open motor route density would be 2.3 mi/mi² in the northern distribution zone and 1.2 mi/mi² in the southern zone. The alternative would comply with the *Grizzly Bear Recovery Plan* and with management guidance for bears outside recovery zones.
Canada Lynx	Alternative 1 would retain 21 large unroaded habitat blocks (>1,500 acres), averaging 5,396 acres each, as refuges for lynx. Active snowmobile trails would remain at 165 miles and off-trail snowmobile closures at 31,350 acres within LAU's. The alternative would remain in compliance with critical habitat requirements and all standards of the *N. Rockies*	Alternative 2 would consolidate some of the existing unroaded habitat blocks—producing 17 large habitat refuges averaging 6,583 acres each. Active snowmobile trails in potential lynx habitat would remain at 165 miles, but off-trail snowmobile closures within LAU's would increase to 40,880 acres. The alternative would comply with critical habitat	Alternative 3 would consolidate more of the existing unroaded habitat blocks—resulting in 14 large habitat refuges averaging 8,666 acres each. Active snowmobile trails in potential lynx habitat would remain at 165 miles, but off-trail snowmobile closures within LAU's would increase to 44,980 acres The alternative would comply with critical habitat	Alternative 4 would consolidate more existing unroaded habitat blocks than Alt. 2 but fewer than Alt. 3. The result would be 16 large habitat refuges averaging 7,575 acres each. Active snowmobile trails in potential lynx habitat would remain at 165 miles, but off-trail snowmobile closures within LAU's would increase to 44,980 acres. The alternative would comply

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	Lynx Mgmt. Direction.	requirements and all standards of the *N. Rockies Lynx Mgmt. Direction.*	requirements and all standards of the *N. Rockies Lynx Mgmt. Direction.*	with critical habitat requirements and all standards of the *N. Rockies Lynx Mgmt. Direction.*
Gray Wolf	Nothing in Alternative 1 would impact known wolf denning or rendezvous areas, diminish prey populations, or increase the probability of negative wolf-human encounters.	Alternative 2 would not impact wolf denning or rendezvous areas or diminish prey populations. It would reduce the potential for wolf-human encounters by lowering open road density in certain areas.	Alternative 3 would not impact wolf denning/rendezvous areas or diminish prey populations. It would reduce the potential for wolf-human encounters by lowering open road density somewhat more than would Alt. 2.	Alternative 4 would not impact wolf denning/rendezvous areas or diminish prey populations. It would reduce the potential for wolf-human encounters by lowering open road density more than would Alt. 2 but a little less than Alt. 3.
Wolverine	No wolverine denning habitat is threatened by the current pattern of snowmobile use in the Planning Area. Non-motorized refuges >1,500 acres would continue to occupy approx. 64% of the area.	The pattern of active snowmobile trails would remain unchanged, thus posing no threat to wolverine denning habitat in the Plan Area. Much like Alt. 1, non-motorized refuges >1,500 acres would occupy about 63% of the area.	The pattern of active snowmobile trails would remain unchanged, thus posing no threat to wolverine denning habitat in the Plan Area. Non-motorized refuges >1,500 acres would increase to occupy approx. 68% of the area.	The pattern of active snowmobile trails would remain unchanged, thus posing no threat to wolverine denning habitat in the Plan Area. As in Alt. 3, non-motorized refuges >1,500 acres would occupy approx. 68% of the area.
Fisher	Alternative 1 would retain 368 miles of routes open to wheeled vehicles on public land and 426 miles of active snowmobile trails. Little of this mileage is in primary fisher habitat and the potential for fisher mortality via trapping along open routes would remain very low.	Alternative 2 would maintain 356 miles of routes open to wheeled vehicles on public land and 399 miles of active snowmobile trails. As with Alt. 1, potential for fisher mortality via trapping along open routes would remain very low.	Alternative 3 would maintain 292 miles of routes open to wheeled vehicles on public land and 409 miles of active snowmobile trails. As with Alts. 1 & 2, potential for fisher mortality via trapping along open routes would be very low.	Alternative 4 would maintain 304 miles of routes open to wheeled vehicles on public land and 405 miles of active snowmobile trails. As with Alts. 1, 2, & 3, potential for fisher mortality via trapping along open routes would be very low.
Black-backed Woodpecker	Alternative 1 would retain current miles of road open to	Alternative 2 would reduce road open to firewood cutters by 3	Alternative 3 would reduce current open roads by 41 miles.	Alternative 4 would reduce current open roads by 27 miles.

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	firewood cutting. Given the extensive acreage of beetle-killed pine outside the road corridors, the impact on potential black-backed woodpecker occupancy would be insubstantial.	miles. Given the vast acreage of beetle- killed pine outside road corridors, the reduction would have no measurable effect on the potential for black-backed woodpecker occupancy.	While loss in area available to firewood cutters would be substantial, it is probably not large enough to measurably increase the potential for black-backed woodpecker occupancy.	While the decline in area available to firewood cutters would be substantial, it is probably not large enough to measurably increase the potential for black-backed woodpecker occupancy.
Western Toad	Alternative 1 would retain 432 miles of open road—83 miles in Riparian Habitat Conservation Areas. Forest road density on this order is a relatively minor factor, compared to other decimating factors, in depressing local toad populations.	Open road would decline to 429 miles—76 miles in Riparian Habitat Conservation Areas. Road density of this magnitude would continue to represent a relatively minor contributing factor in depressing local toad populations.	Open road would decline to 391 miles—70 miles in Riparian Habitat Conservation Areas. These road densities, though less than other alternatives, would be unlikely to produce measurably larger local toad populations.	Open road would decline to 399 miles—70 miles in Riparian Habitat Conservation Areas (the same as Alt. 3). These road densities, though less than in Alts. 1 & 2 would be unlikely to produce measurably larger local toad populations.
Flammulated Owl	Alternative 1 would retain 49 miles of open road in flammulated owl habitat in which firewood cutters could remove snags potentially suitable as nesting habitat. The impact is highly unlikely to affect flammulated owl occupancy of the landscape.	Alternative 2 would reduce open road in flammulated owl habitat available to firewood cutters to 44 miles. The difference from Alt. 1 is unlikely to be measurable in terms of flammulated owl presence in the landscape.	Alternative 3 would reduce open road in flammulated owl habitat available to firewood cutters to 40 miles. The difference from other alternatives is unlikely to be measurable in terms of flammulated owl presence in the landscape.	Like Alt. 3, Alternative 4 would reduce open road in flammulated owl habitat available to firewood cutters to 40 miles. The difference from Alts. 1 & 2 is unlikely to be measurable in terms of flammulated owl presence in the landscape.
Pileated Woodpecker	Open roads available to firewood cutting in pileated woodpecker habitat would remain at approx. 147 miles. This has an indirect impact in that it presents an opportunity for firewood cutters to	Open roads available to firewood cutting in pileated woodpecker habitat would drop to approx. 137 miles. Given the general rarity of sufficiently large nesting trees in the road corridors, the difference would	Open roads available to firewood cutting in pileated woodpecker habitat would drop further to approx. 123 miles. Given the rarity of sufficiently large nesting trees in the road corridors, this decline would not	Open roads available to firewood cutting in pileated woodpecker habitat would drop further to approx. 125 miles. As with other action alternatives, this decline would not be measurable in terms of the

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	remove large snags (generally >25 inches dbh) that represent potential nesting substrate for the woodpeckers.	not be measurable in terms of the potential for pileated woodpecker occupancy of the landscape.	be measurable in terms of the potential for pileated woodpeckers to occupy the landscape.	potential for pileated woodpeckers to occupy the landscape.
Northern Goshawk	Open roads available to firewood cutters would remain at 4.1 miles in goshawk nesting habitat and 195 miles in foraging habitat. This is an indirect effect, as snags taken for firewood provide habitat for some goshawk prey.	Open roads available for firewood cutting would be 4.3 miles in goshawk nesting habitat and 181 miles in foraging habitat. These differences are not sufficient to be reflected in local goshawk occupancy compared to Alt. 1.	Open roads available for firewood cutting would be 4.0 miles in goshawk nesting habitat and 162 miles in foraging habitat. These differences are not sufficient to be reflected in local goshawk occupancy compared to Alts. 1 & 2.	Open roads available for firewood cutting would be 4.1 miles in goshawk nesting habitat and 163 miles in foraging habitat. Differences between this and other alternatives are insufficient to be reflected in goshawk occupancy.
Hairy Woodpecker	Roads available to firewood cutters would remain at 43 miles in *optimal* habitat and at 294 miles in *mature forest* habitat in general. Removal of potential feeding and nesting trees is an indirect effect. Given the vast acreage of snags being created by bark beetles across the landscape, losses in the road corridor would not affect hairy woodpecker population viability.	Open roads available to firewood cutters would decline slightly to 41 miles in *optimal* hairy woodpecker habitat and to 260 miles in *mature forest* habitat. As with Alt. 1, the losses in the road corridor would represent a relatively small loss of habitat components given the proliferation of snags across the landscape.	Open roads available to firewood cutters would decline to 36 miles in *optimal* hairy woodpecker habitat and to 233 miles in *mature forest* habitat. As with Alts. 1 & 2, losses of snags in the road corridor would be insubstantial given the ongoing proliferation of dead trees across the landscape.	Open roads available to firewood cutters would decline to 37 miles in *optimal* hairy woodpecker habitat and to 235 miles in *mature forest* habitat. As with other alternatives, losses of snags in the road corridor would be insubstantial given the ongoing proliferation of dead trees across the landscape.
American Marten	Open roads available to firewood cutters in potential marten habitat would remain at approx. 294 miles. Removal	Open roads available to firewood cutters in potential marten habitat would decline to approx. 260 miles. The	Open roads available to firewood cutters in potential marten habitat would decline to approx. 233 miles. The	Open roads available to firewood cutters in potential marten habitat would decline to approx. 235 miles—similar to

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	of snags and logs from the road corridor represents an indirect effect. Given the acreage of beetle-killed trees in the landscape, losses in the road corridor would be insubstantial in terms of marten habitat availability.	resulting retention of snags and logs (compared to Alternative 1) is highly unlikely to be large enough to generate a measurable increment in local marten populations.	consequent retention of snags and logs (compared to Alternatives 1 and 2) is unlikely to be large enough to generate a measurable increment in local marten populations.	Alt. 3. The consequent retention of snags and logs (compared to Alts. 1 & 2) is unlikely to be large enough to generate a measurable increment in local marten populations.
Key Areas: Baldy Ridge – Spotted Dog Creek – Kading	Local open road density would remain at 1.5 mi/mi² and motor trail density at 0.6 mi/mi². The only vehicle access to Baldy Ridge during the hunting season would be via motor trails from the Kading side. A hunting season snowmobile closure would remain intact. These restrictions, coupled with precarious road/trail conditions after mid fall, would retain respectable fall security for big game animals.	Local open road density would remain at 1.5 mi/mi²; motor trail density would drop to 0.4 mi/mi². The Kading cabin – Baldy Ridge trail would shift to non-motorized use. On other trails, motor bike and ATV riding would continue into mid-fall, but all vehicle access to Baldy Ridge would cease with the advent of the hunting season. Snowmobiles would be allowed after the hunting season.	Local open road density would decline to 0.1 mi/mi². All trails would be closed to motorized use. Alternative 3 would effectively eliminate all motorized access to Baldy Ridge and upper Spotted Dog Crk, as well as beyond Kading campground along the Little Blackfoot. These routes would be converted to foot trails—in essence, creating an unofficial addition to the Electric Peak Roadless Area just to the southeast.	Local open road density would decline from 1.5 mi/mi² to 0.7 mi/mi²—considerably higher than Alt. 3 but half that of Alts. 1 & 2. Vehicle access to Baldy Ridge would be by a single road coming up out of Spotted Dog Crk to the west. This route would be closed during the hunting season. As in Alt. 3, all trails would be closed to motor vehicles year-round and maintained for hikers, equestrians, and mountain bikers.
Key Areas: Negro Mountain – Lower Telegraph Creek	Local open road density would remain at 1.7 mi/mi². 0.9 mi of user-made trail would be available. The Moose Gulch road (#1857-B1) would remain closed to vehicles at its upper end, forestalling vehicle access to Negro Mtn from Telegraph Crk. Road #1857-A1 northeast	Local open road density would rise to 2.2 mi/mi². There would be no motor trails. Road #4100 would allow vehicle access from the west once a Little Blackfoot River bridge is built. The Moose Gulch road would be closed entirely, but road #1857-A1 would be opened to vehicle	Local open road density would decline slightly to 1.6 mi/mi². No new motor trails would be created. Road #4100 to the west would be closed yearlong. The Moose Gulch road would be closed entirely, but currently-closed road #1857-A1 would be open to vehicles in summer to	Local open road density would rise from 1.7 to 2.00 mi/mi². This is a function No new motor trails would be created. No vehicles would be allowed on the Moose Gulch road, but currently-closed road #1857-A1 would allow motorized access from Telegraph Crk in summer—

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	of Negro Mtn would remain closed all year to provide for elk security and habitat effectiveness. Road #1857-D1 to the south, though officially closed, would continue to be driven by vehicles to gain access to the closed road system in upper Telegraph Crk. Vehicles would continue to access road #4100 from the west by fording Ontario Creek.	traffic from Telegraph Crk in summer. This is likely to periodically displace elk from local summer range. The route would be closed for the hunting season. To the south, road #1857-D1 would be legally open and provide yearlong vehicle access to the currently-closed upper Telegraph road system—an area now restricted for big game security. Elk security would thus decline in this area.	provide access from Telegraph Crk—which is likely to periodically displace local elk. The route would be closed after Oct. 15. Road #1857-D1 to the south would be off-limits to motorized use to enhance elk habitat security—although without adequate signing and physical barriers, it would continue to be driven illegally.	which is likely to periodically displace local elk. This route would be closed after Oct. 15. Road #1857-D1 to the south would remain off-limits to motorized use to enhance elk habitat security. Road #4100 would not provide vehicle access from the west until a Little Blackfoot River bridge is in place.
Key Areas: Upper Telegraph Creek	Local open road density would remain at 1.3 mi/mi²—mostly from open roads in the eastern half of the area. User-made motor trails amount to 0.1 mi/mi². Illegal use of restricted road #1857-D1 coming in from the Negro Mtn area to the north would continue to subvert road closures designed to provide for big game security and habitat effectiveness following timber sales in the 1970's and 1980's.	Local open road density would increase substantially from 1.3 to 2.2 mi/mi². There would be no motor trails. Alternative 2 would open 5.3 miles of currently closed roads (part of the #1859 road system) in the western half of the area to year-round use. This would measurably erode summer habitat effectiveness and fall security for big game animals, as well as other animals wary of motorized activity, throughout this local area.	Local open road density would decline slightly from 1.3 to 1.2 mi/mi². There would be no motor trails. Integrity of current road closures in the western half of the area would be dependent on better signing and physical barriers to reduce illegal motorized use [though such actions are not part of the current proposal]. Local big Game security would be substantially higher than in Alt. 2.	Local open road density would be more or less the same as at present—1.3 mi/mi². But there would be no designated motor trails. Integrity of current road closures in the western half of the area would be dependent on better signing and physical barriers to reduce illegal motorized use [though such actions are not part of the current proposal]. Local big game security would be similar to Alt. 1, somewhat less than in Alt. 3, and notably better than in Alt. 2
Key Areas: Upper Ontario Creek – Bison	Local open road density would remain at 0.5 mi/mi². There would be no legally open	Local open road density would remain at 0.5 mi/mi². Motor trail density would increase to	Local open road density would remain at 0.5 mi/mi². No new motor trails would be	Alternative 4 is essentially identical to Alt. 2. Local open road density would remain at

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
Creek	motor trails. The extensive road system in upper Ontario and Bison Crks, built for past timber sales, would remain gated, with the exception of dead-end road #495-D1 in the eastern half of the area. A groomed snowmobile route would continue to be available on roads #495-D1 and #4104-A1 after Nov. 30.	0.3 mi/mi² with the opening of currently-closed road #4104-A1 as a motor trail. This would connect with currently-open road #495-D1 and provide an ATV/bike route that would bisect the area between upper Telegraph and Monarch Crks—substantially elevating wildlife disturbance through these alpine basins during the summer. The trail would not be open during the hunting season.	established. The existing snowmobile route through the area would be available after Dec. 1. Alternative 3 is nearly identical to Alternative 1, retaining the existing condition.	0.5 mi/mi² as at present. Motor trail density would increase to 0.3 mi/mi² with the opening of currently-closed road #4104-A1 as a motor trail. As in Alt. 2, this would provide a legal ATV/bike route that would bisect the area between upper Telegraph and Monarch Crks—increasing wildlife disturbance in the alpine basins throughout the summer. As in Alt. 2, the trail would be closed during the hunting season.
Key Areas: Hahn Creek – Mike Renig Gulch – Flume Gulch	Local open road density would remain at 1.2 mi/mi². There would be no designated motor trails. The gate that blocks public wheeled vehicle access to upper Flume and Mike Renig Gulches year-round would remain intact—although local property owners would still be allowed access to their inholdings beyond the gate. The main road would continue to serve as a snowmobile route in winter. For the most part, wildlife use of these productive drainage-head basins would remain high.	Local open road density would remain at 1.2 mi/mi² for most of the year. However, the gate on the main road (#1856) in Little Flume Gulch would be opened for the big game rifle season, allowing motorized access to 4 miles of currently closed road. As a result, open road density would increase to 1.6 mi/mi² during this period. It is likely that any elk in this area at the start of the rifle season would move to more secure sites in adjacent drainages in order to escape hunters.	With a couple minor exceptions, Alternative 3 would maintain the existing condition: it is very much like Alt. 1 and would maintain the same level of wildlife habitat integrity in this key area. Local open road density would remain about the same at 1.2 mi/mi². There would be no designated motor trails. As with Alt. 1, primary problems stem from the ease with which hunters can walk the road system and the need to provide vehicle access to local landowners in the closed area.	Alternative 4 is identical to Alt. 3. Open road density would be at 1.19 mi/mi² year-round and there would be no designated motor trails. Landowners would be able to drive to their properties behind the closed Gate on the Hahn Crk – Mike Renig Gulch Road.

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
Key Areas: Slate Creek – Elliston Creek	Local open road density would remain at 0.7 mi/mi². There would be no designated motor trails—although illegal OHV use of a pioneered trail around Slate Lake would continue in the absence of effective enforcement. If this use were eliminated, the Slate Lake area would serve as a non-motorized focal area for wildlife year-round.	Local open road density would increase to 1.3 mi/mi². Legal motor trail density would increase to 0.34 mi/mi² with the opening of 1.8 mi of currently-gated road to ATVs and trail bikes. The Slate Lake area would remain free from motorized use during the hunting season, but not in summer. This activity would periodically displace elk and other animals wary of human activity from the Slate Lake area.	Local open road density would remain at 0.69 mi/mi². No new motor trails would be established. With effective enforcement of road and area closures, the Slate Lake area would provide a non-motorized focal area for wildlife year-round. Alt. 3 is essentially identical to Alt. 1 (with enforcement).	Alternative 4 is identical to Alt. 3. Local open road density would remain at 0.7 mi/mi². There would be no designated motor trails. With effective enforcement, the Slate Lake area would serve as a non-motorized focal area for wildlife year-round.
Key Areas: Lower Sweeney Creek – Blue Cloud	Alternative 1 maintains existing condition. Local open road density would remain low at 0.6 mi/mi² (2.2 mi of 4wd access road). A 12 mile maze of motor trails produces a local open trail density of 2.9 mi/mi². There are no seasonal restrictions, and snowmobiles use the trails when snow is adequate. The NW end of the area and adjacent slopes provide prime winter range for big game animals. Motorized activity in this part of the area from mid fall	Local open road density would remain at 0.6 mi/mi². Motor trail density would decline to 2.6 mi/mi² with the closure of some erosive and duplicative trail sections. Trails would be closed to motorized use during the hunting season, winter, and early spring to prevent disturbance of big game animals. Since this low-elevation area is of much less importance as summer range, the impact of motorized use on big game would be appreciably less than in Alt. 1.	Local open road density would drop to 0.2 mi/mi². All local trails would be reserved for non-motorized users (hikers, mountain bikers, equestrians) year-round. It is unlikely that big game use of the area would increase noticeably, because human presence, while mostly non-motorized, would remain high. However, as in Alt. 2, the intensity of winter range disturbance should remain much lower than in Alternative 1.	Alternative 4 is identical to Alt. 3. Local open road density would drop to 0.15 mi/mi² - with the only open road being a short section of the Sweeney Crk Road along the SW border of the area. All local trails would be reserved for non-motorized uses.

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	through mid spring is a serious disruptive influence.			
Key Areas: Priest Pass – CDNST	Local open road density would remain at 1.1 mi/mi² and motor trail density at 0.1 mi/mi². The CDNST south of Priest Pass would remain open as a primitive 4wd road (#1802-B2). The CDNST north of the pass would remain closed to vehicles—although illegal use is likely to continue. The same is true of user-created trail #U-205 northeast of the pass. Road #1846, also on the east side, would remain open. Vehicles on these routes would continue to complicate wildlife use of this focal habitat area in spring, summer, and fall.	Local open road density would decline slightly to 1.1 mi/mi², and no motor trails would be retained. 4wd roads along the CDNST and road #1846 would be closed to all vehicle use. These restrictions would improve local habitat effectiveness in spring, summer, and early fall. Alternative 2 would open a short gated road system (roads #335-A1, A2) 2 miles east of the pass to provide vehicle access during the big game rifle season. This is not an area frequented by elk at that time, and the change is unlikely to have much effect on big game security.	Local open road density would decline to 0.7 mi/mi², and no motor trails would be sanctioned. Alternative 3 would establish all of the road and trail closures proposed in Alternative 2, but it would also retain the year-round closure in the #335-A1, A2 road system. Taken altogether, these measures would improve both habitat effectiveness and fall security for big game and a variety of other species that move through and linger in the Priest Pass area.	Alternative 4 is identical to Alt. 3. Local open road density would be 0.7 mi/mi². There would be no sanctioned motor trails. The resulting configuration of open roads would represent an improvement in the integrity of local wildlife habitat opportunity compared to current conditions.
Key Areas: Black Mountain – Meyers Hill – upper Ophir Creek	Local open road density would remain at 0.6 mi/mi². There would be no legally open motor trails, but the illegal trail off the end of the Black Mtn road would remain accessible to motor bikers—retaining an actual motor trail density of 0.6 mi/mi². This trail disrupts a key habitat enclave and linkage area for	Local open road density would decline somewhat to 0.4 mi/mi². Closure of the Black Mtn road at the 0.5 mile mark would make access to the illegal motor trail at its upper end difficult and enforcement of the closure much easier to accomplish [esp. with eventual development of a trailhead at the 0.5 mile point]. The result would be improved	As in Alt. 2, local open road density would decline to 0.4 mi/mi². Closure of the Black Mtn road would make access to the illegal motor trail at its upper end difficult and enforcement of the closure much easier to accomplish. As with Alt. 2, the result would be improvement in the integrity of the key wildlife refugium and	Alternative 4 is identical to Alts. 2 and 3. Open road density would be 0.4 mi/mi²—a result of primary road #137 along the southern border of the area and several short, dead-end access roads running northward off of it. Density of sanctioned motor trails would be 0.1 mi/mi².

Wildlife Component	Alternative 1 Effects (existing condition)	Alternative 2 Effects	Alternative 3 Effects	Alternative 4 Effects
	wildlife south of Black Mtn—including elk, deer, black bears, grizzly bears, mountain lions, wolverines, and lynx.	effectiveness of the key wildlife refugium and linkage zone south of Black Mtn. Legal motor trail density would be 0.1—a result of a short stretch of trail on the north side of Meyers Hill.	linkage zone south of Black Mtn. Motor trail density would be 0.1 mi/mi². Alternatives 2 and 3 are identical in this area.	

APPENDIX D. FOREST PLAN AMENDMENT FOR BIG GAME SECURITY

Purpose and Need for Amendment

The Helena Forest Plan (HFP) (USDA 1986) established standards for managing National Forest Service (NFS) road systems as a method to maintain or improve big game security[1] during the hunting season. Under the 1986 Forest Plan, big game security is based on the relationship between open road densities during big game rifle season and the amount of hiding cover within an elk herd unit (EHU). Meeting this Forest Plan standard has been problematic for several reasons. The Forest Plan was based on research conducted for the most part off-Forest in other locations (USDA 1983, p. 10). Much of the hiding cover research upon which the standard was crafted was conducted in forests that tended to be more heavily forested than the HNF. While several of these studies acknowledge the more open terrain the further east one goes in Montana, the numeric determinant was primarily based on west side models.

Furthermore, the original analysis unit was intended to be a "habitat analysis unit" (HAU) that approximated the home range of elk during the summer-fall period (10 to 40 square miles) (USDA 1978, p. 21). The HAU scale generally approximated a timber compartment unit (*Ibid*). Forest Plan Big Game Standard 4(a) provides for an analysis unit that is a "large geographic area, such as a timber sale analysis area, a third order drainage, or an elk herd unit" (USDA 1986 p. II/18). In the Divide landscape, herd unit sizes range from 55 to 136 square miles; areas much larger than the original intent. Legal interpretations have confounded the Forest's ability to apply Standard 4(a) at the intended geographic scope. It's impractical to apply a standard at an area many times greater in size than the intended scope.

In the twenty eight years since the development of the Forest Plan, a substantial amount of scientific studies, surveys, and other information have accrued. Studies have suggested other measures that are also appropriate for measuring big game security, and are more closely tied to open motorized route densities during times of elk stress and increased vulnerability (i.e. hunting season). In addition, the elk harvest metrics used by the Montana Department of Fish, Wildlife and Parks (MDFWP) to evaluate and manage elk vulnerability during the hunting season (the reason for providing security) have evolved, leaving part of the standard as currently written useless because it relies on data methods no longer available or in practice. As a result, public access is being constrained without the clear benefits for elk envisioned by the standard.

This programmatic Forest Plan amendment for the Divide Travel Management project area is needed to more closely align current science, local conditions, and other information with the

[1] Big game security in the Helena National Forest Plan is defined according to the existing hiding cover to open road density ratio and is intended to "maintain big game habitat capability and hunting opportunity" (Big Game Standard 4(a), USDA 1986, p. II/17). Security in the amendment to the existing Forest Plan Standard 4(a) is generally defined as "the area that will, during periods of hunting stress, hold elk because of geography, topography, vegetation, or a combination of those features" (Lyons and Christensen 1992) and specifically is measured as large blocks $\geq$ 250 acres in size, $\geq$ ½ mile from an open motorized route during the hunting season which is defined as 10/15 through 12/1. Security and vulnerability are often used interchangeably but actually reflect a causal relationship: when security is high vulnerability tends to be low, and vice-versa. Vulnerability is generally described as *"a measure of elk susceptibility to being killed during the hunting season"* (Lyons and Christensen 1992). See the section *Concept of Elk Security* for more information.

needs of big game, particularly elk, to meet the intent of the Forest Plan. It considers the impacts of open motorized routes on elk security, establishes blocks of secure habitat, and can be measured regardless of changes in hiding cover. While the proposed amendment decouples hiding cover from security during the hunting season, several Forest-wide and Management Area standards remain in place that govern management of hiding cover.

The assumptions built into the existing (1986) standard 4(a) have not proven useful in gauging or guiding management activities under the Forest Plan. Actual elk populations and trends as monitored over the last twenty six years simply do not correlate with this existing standard or its assumptions. Elk numbers have consistently increased during this time period and the existing standard needs to be revised to address recent elk management challenges.

Background

Overview

Elk serve as a management indicator for hunted species for the Helena National Forest (USDA 1986, p. II/17). To address this, the Forest Plan contains Forest-wide and Management Area specific goals, objectives, and standards. The Forest Plan also provides a description of the desired future condition which would result from carrying out planned management practices (*Ibid*, pp. II/12-14). These big game goals, objectives and standards were designed to provide habitat on the Helena National Forest to support an elk population of 6400 elk by the year 2000 in support of State of Montana goals for harvestable elk (*Ibid*, p. V/5). There were an estimated 4900 elk on the Forest in 1981 (*Ibid,* p. V/5).

Many of the factors affecting elk numbers and distribution are beyond the control of National Forest managers. Examples include hunting regulations/pressure, nonhuman predation, winter kill, disease, climate change, stochastic events, and lack of public access to hunt big game on private land (MDFWP and USDA 2013 p. 3). The intent of Forest Plan goals, objectives and standards are to guide habitat management on National Forest System lands.

Forest Plan goals, objectives, and desired future conditions for wildlife, including big game are:

- Goal: Maintain and improve the habitat over time to support big game and other wildlife species (USDA 1986, p. II/1).
- Objective: To maintain elk habitat capacity, an annual program of habitat improvement will be implemented (*Ibid*, p. II/4).
- Desired future condition: By the end of the first decade, wildlife range will be improved to increase forage production; the wildlife potential on winter range should increase slightly while the potential on summer range should remain at current [1986] levels. By the end of the fifth decade, the Forest's ability to support elk on winter range will increase, while the ability to support elk on summer range will decrease slightly (*Ibid,* pp. II/12-14)

The Forest Plan contains Forestwide big game standards and big game standards specific to the management areas identified in the Forest Plan. These standards are summarized in the following table which includes only those management areas within the Divide Travel Plan project area for which a big game standard is in place.

Table D.1 Forest-wide and Management Area Specific Standards Relevant to Big Game

Forest Plan Reference	Standard
Forest-wide p. II/17	Subject to hydrologic and other resource constraints, elk summer range will be maintained at 35 percent or greater hiding cover and areas of winter range will be maintained at 25 percent or greater thermal cover in drainages or elk herd units.
Forest-wide, pp. 11/17-18	Road management will be implemented to at least maintain big game habitat capability and hunting opportunity.
Forest-wide p. II/18	Elk calving grounds and nursery areas will be closed to motorized vehicles during peak use by elk. Calving is usually in late May through mid-June and nursery areas are used in late June through July.
Forest-wide p. II/18	All winter range areas will be closed to vehicles between December 1 and May 15. Exceptions (i.e., access through the winter range to facilitate land management or public use activities on other lands) may be granted.
Forest-wide p. II/19	The Forest Road Management Program will be developed in conjunction with MDFWP and interested groups or individuals. The Road Management Program will contain the specific seasonal and yearlong road, trail, and area restrictions and will be based on the goals and objectives of the management areas in Chapter III of the Forest Plan.
Forest-wide p. II/19	Representatives from the Helena Forest and MDFWP will meet annually to review the existing Travel Plan.
Forest-wide p. II/19	On elk summer range the minimum size area for hiding cover will be 40 acres and the minimum size area on winter range for thermal cover will be l5 acres.
Forest-wide p. II/19	Montana Cooperative Elk-Logging Study Recommendations, in Appendix C, will be followed during timber sale and road construction projects.
Forest-wide p. II/19	Inventorying and mapping important big game summer/fall and winter ranges will continue.
Forest-wide p. II/19	Any proposed sagebrush reduction programs will be analyzed on a case-by-case basis for the possible impact on big game winter range.
H-1, p. III/17	Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance the diversity of wildlife habitat. Maintain adequate thermal and hiding cover adjacent to forage areas as determined by a wildlife biologist. Generally this means providing at least 25 percent thermal cover, on identified winter range.
H-2, p. III/20	Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance the diversity of wildlife habitat. Maintain adequate thermal and hiding cover adjacent to forage areas as determined by a wildlife biologist. Generally this means providing at least 25 percent thermal cover, on identified winter range.
L-1, p. III/11	Specific wildlife and fisheries needs will be identified and considered when developing allotment management plans, provided the needs are compatible with area goals.

Forest Plan Reference	Standard
L-2, p. III/14	Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, may be used to maintain and/or enhance the quality of big game winter range. Projects will be coordinated for livestock and big game needs. Maintain adequate thermal and hiding cover adjacent to forage areas. Generally this means providing at least 25 percent thermal cover, where available, on identified winter range.
M-1, p. III/5	Management practices to maintain or improve wildlife habitat will be permitted where necessary to meet the objectives of adjacent management areas.
P-3, p. III/73, Electric Peak	Wildlife habitat improvement projects will conform to Forest Service wilderness policy.
R-1, p. III/24	Habitat improvement projects, such as prescribed fire and water developments, may be used to maintain or improve the fish and wildlife habitat, if the projects are compatible with the area's goals.
T-1, p. III/31	Wildlife and fisheries habitat improvement projects may be implemented, provided they are compatible with the management area goals.
T-3, p. III/39	Maintain a minimum of 35 percent hiding cover for big game. Maintain thermal cover adjacent to forage areas. Appendix C provides guidance for thermal cover. Wildlife habitat improvement practices, including road management, prescribed fire, and timber harvest, may be used to maintain and/or enhance the quality of big game summer habitat.
T-4, p. III/43	Where elk habitat exists, project design will incorporate management practices to maintain or enhance summer and winter habitat to the extent that the VQOs for the area are met.
T-5, p. III/47	Wildlife and fisheries habitat improvement projects may be implemented, provided they are compatible with the management area goals. -Maintain adequate thermal and hiding cover adjacent to forage areas, provided timber harvest volumes are not significantly reduced over the rotation period.
W-1, p. III/50	Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance the quality of big game and nongame habitat. Maintain adequate thermal and hiding cover adjacent to forage areas. Generally this means providing at least 25 percent cover, where available, on identified winter range.
W-2, p. III/53	Most new roads and about 50% of existing roads will be closed, at least seasonally.

Forest Plan Reference	Standard
	Wildlife habitat improvement practices, including road management, prescribed fire, and other techniques, will be used to maintain and/or enhance big game calving and summer habitat. Maintain adequate thermal and hiding cover adjacent to forage areas.

The standard that is the subject of this programmatic amendment is:

Forestwide Standard Big Game 4(a) (USDA HFP 1986, pp. II/17 – II/18) *Road management will be implemented to at least maintain big game habitat capability and hunting opportunity. To provide for a first week bull elk harvest that does not exceed 40 percent of the total bull harvest, roads will be managed during the general big game hunting season to maintain open road densities with the following limits.*

Existing Percent Hiding Cover (1)	Existing Percent Hiding Cover (2)	Max Open Road Density mi/mi^2
56	80	2.4
49	70	1.9
42	60	1.2
35	50	0.1

(1) Forest Service definition - a timber stand which conceals 90 percent or more of a standing elk at 200 feet.
(2) MDFWP definition - a stand of coniferous trees having a crown closure of greater than 40 percent.

The existing hiding cover to open road density ratio should be determined over a large geographic area, such as a timber sale analysis area, a third order drainage, or an elk herd unit.

Big game security, according to this standard, is based on the relationship between the amount of hiding cover in an EHU and the open road density during big game rifle season. Hiding cover is defined (HFP p. II-18) as either a timber stand which conceals 90% or more of a standing elk at 200 feet, which can only be measured in the field, stand by stand; or as stands of coniferous trees having a crown closure greater than 40%, which can be determined by aerial photo interpretation and satellite imagery[2] . Under the Forest Plan, either method is acceptable (USDA 1986, p. II/18). Open road densities include all motorized routes open during the big game rifle season, October 15 through December 1, and are calculated at 100% the length of all public roads and 25% the length of private roads. This relationship was based on research that indicated roads with less use have reduced impacts to elk (Perry and Overly 1976, Witmer and deCalesta 1985, and Rowland et al. 2000).

[2] This analysis utilizes the MDFWP definition of hiding cover – i.e. stands of coniferous trees having a crown closure greater than 40%. The 40% canopy cover metric is an acceptable 'proxy' for mapping hiding cover as it is generally assumed that stands with 40% canopy cover or greater would in turn provide adequate screening cover that would hide 90% of an elk at 200 feet, the functional definition of hiding cover . This relationship of canopy cover and stand structure is based on modeling done by Lonner and Cada (1982) and others that used canopy cover to predict the relationship between hiding cover (as estimated by canopy cover), road densities, and harvest rate the first week of the general hunting season.

The big game security index is calculated for EHUs that include all lands, public and private, within the respective EHU. This means that elk security as determined by this index is also a function of road densities and timber harvest on private lands outside management control of the HNF. Elk may use habitat differently relative to hiding cover and motorized routes on private land which often has different hunting pressure levels than public land. Table D.2 summarizes the current status of each EHU in the Divide Travel Plan project area relative to this index and includes reference to MDFWP's population objectives which are described in further detail in the section *Correlation between Standard 4(a) and Elk Numbers.*

Table D.2 Big Game Security – Hiding Cover Relative to Open Road Density

Elk Herd Unit (Associated Hunting District – HD)	Total Square Miles	Acres Hiding Cover[1]	Percent Hiding Cover[1]	Miles of Open Road (10/15-12/1)	Open Road Density (10/15-12/1)	Meets HFP Standard #4a	MDFWP HD Population Objectives[2]	Current Status of Population Objectives based on MDFWP Aerial Survey Data
Black Mountain/ Brooklyn Bridge (HDs 335, 343)	88	29,260	52%	166	1.9	No	***HD 335*** 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Greenhorn (HDs 293, 335, 343)	88	16,871	30%	155	1.8	No	***HD293*** 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Jericho (HDs 215, 293, 335, 343)	55	23,091	65%	68	1.2	Yes	***HD 215*** 1000 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio above objectives
							HD293 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives

Elk Herd Unit (Associated Hunting District – HD)	Total Square Miles	Acres Hiding Cover[1]	Percent Hiding Cover[1]	Miles of Open Road (10/15-12/1)	Open Road Density (10/15-12/1)	Meets HFP Standard #4a	MDFWP HD Population Objectives[2]	Current Status of Population Objectives based on MDFWP Aerial Survey Data
Little Prickly Pear/ Ophir (HDs 293, 343)	136	40,222	46%	220	1.6	No	***HD293*** 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 343 560-840 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio meet objectives
Quart Creek (HD 335)	57	16,477	45%	62	1.1	No	***HD 335*** 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio
Spotted Dog/ Little Blackfoot (HDs 215, 293, 335)	129	48,306	59%	148	1.2	No	***HD 215*** 1000 elk 10 bulls/ 100 cows	Elk numbers and bull/ cow ratio above objectives
							HD293 750 elk 10 bulls/ 100 cows	Elk numbers below objectives; bull/cow ratio above objectives
							HD 335 480-720 elk 10 bulls/ 100 cows	Elk numbers above objectives; below objectives for bull/cow ratio

[1] Cover as defined by MDFWP – - a stand of coniferous trees having a crown closure of greater than 40 percent
[2]See Table D.3 *Elk Management Units (EMU), Hunting Districts and Elk Herd Units (EHU) within the Divide Travel Project Area* for the relationship between the EHUs and MDFWP hunting districts.

Only one (Jericho) of the six EHUs in the Divide Travel Plan project area meets the big game security standard threshold (Big Game standard #4a: HFP p. II-18) under current conditions. Relative to MDFWP population objectives, four EHUs fall within HD 293 that is below MDFWP population objectives for elk numbers but above objectives for bull/cow ratio objectives (Greenhorn, Jericho, Little Prickly Pear/Ophir, and Spotted Dog/Little Blackfoot). Note that the one EHU that ***does*** meet Big Game Standard 4(a) occurs within HDs that are across the board in terms of MDFWP population objectives, which suggests that the current standard may be insensitive to elk population responses to their environment and/or factors outside of Forest management are influencing elk.

Even if all open motorized routes managed by the Forest were eliminated, three of the six EHUs (Greenhorn, Little Prickly Pear/Ophir, and Quartz Creek) would still not comply with Standard 4(a). This is due to hiding cover comprising less than 50% in those herd units. One of the EHUs (Black Mountain/Brooklyn Bridge) would require closure of 140 miles of its roads to achieve compliance.

Big game security in the Divide Travel Plan project area, as currently measured under the Forest Plan, will not improve in the foreseeable future because hiding cover will continue to decline as trees killed by the ongoing bark beetle epidemic begin to fall *en masse* over the next few years. Motorized route density management on the Helena National Forest cannot compensate for this loss of cover, so the standard as currently written will remain largely unmet. At the same time, elk numbers and bull/cow rations in the project area vary in terms of MDFWP's objectives depending on the respective HD.

Relationship of Forest Plan Big Game Standard 4(a) and Elk Management

Forest Plan Elk Population Goals

Elk numbers have been increasing across the west and in Montana since the early to mid- 1900s. Statewide, post-season elk numbers increased from 8,000 in 1922 to 55,000 in 1978 to about 160,000 in 2004 (MDFWP 2004, pp. 4-5). Thus, there are no viability concerns for Rocky Mountain elk in Montana or on the Helena National Forest. This is also supported by their global status of "G5' and the statewide status of 'S5' which are both defined as *"common, widespread, and abundant…"*[3] However, elk remain a management indicator species on the Forest and are an economically and socially important species, with large public interest. They continue to provide hunting, wildlife viewing, and photography opportunities, as well as fill the ecological roles associated with having this native species on the landscape. Forest Plan direction related to big game is in place to ensure that sufficient habitat is available to maintain elk on public land in order to provide those consumptive and non-consumptive uses (USDA 1986, pp. II/17-18).

The big game standards found in the HNF Plan are based on state population goals outlined in *The Northern Regional Plan* (USDA 1981, pp. 4-16 and B-3). The Montana goals were derived from the *1978 Montana Statewide Comprehensive Outdoor Recreation Plan* (SCORP 1978). Big game goals and objectives embodied in the Montana plan included maintaining *"an available supply of big game to meet demand for all types of big game oriented recreation while insuring the protection and perpetuation of all big game species and their ecosystems"* (*Ibid*, p. 3). Statewide goals for elk in particular included protecting and perpetuating *"elk and their habitat*

[3] (See http://fieldguide.mt.gov/displayClasses.aspx?Kingdom=Animalia)

and to increase the supply of available, harvestable elk to meet demands for hunting and non-hunting recreation" (*Ibid*, p. 35). The Montana Plan delineated goals and objectives by the respective 'Fish and Game Regions', the same regions in place today.

According to the *Northern Regional Plan* there were approximately 70,000 elk on the National Forests in Montana around 1981 (USDA 1981, p. 4-16 Table IV-4). State population goals projected for 1995 were intended to satisfy the growing demand for hunting and aesthetic purposes. The *Northern Regional Plan* identified desired population goals by State (*Ibid,* p. 4-17 Table IV-5) and National Forest based on those statewide goals *(Ibid,* p. B-3 Table B-3). The disaggregated total for the HNF was 6400 by year 2000.

The HNF is located within several hunting districts identified by MDFWP (Figure D.1). The total number of elk that have been observed in these hunting districts through the 2013 aerial surveys is 14,289 (MDFWP aerial survey data). Some of these hunting districts barely overlap with the HNF. Discounting those HDs, the total number of elk that have been observed on and around the Forest is 10,727 – although this is probably an underestimate because elk that occur in the 'discounted' HDs do spend some time on the Forest. Nevertheless, the number of elk associated with the HNF is well in excess of the 6,400 population target identified in the HNF Plan (USDA 1986, p. V/5).

Montana has maintained the longest general elk-hunting season (5-weeks) of all western states; a tradition that has been in place for several decades. When the Helena National Forest Plan was crafted in 1986, Standard 4(a) was established to facilitate that longer hunting season while maintaining and/or improving big game security that would ensure that elk populations post-harvest remained aligned with MDFWP objectives (USDA 1986, pp. 11/17-18 and V/5). At that time, MDFWP collected data to determine the percentage of bulls harvested during the first week of the general big game hunting season, as reflected in Standard 4(a). However, MDFWP no longer collects that data. Rather, MDFWP now relies on bull to cow ratios measured through aerial survey trend counts. These trends are used to determine and adjust harvest regulations that allow MDFWP to achieve their elk population objectives (MDFWP 2004).

MDFWP Elk Management

Elk management during the hunting season focuses on maintaining population numbers well above viability thresholds, protecting certain sex and age classes from over-harvest, providing public hunting opportunity, and attempting to balance elk distribution across public and private lands. While these functions are a responsibility of Montana Fish, Wildlife and Parks, the HNF strives to complement their efforts by managing elk habitat on the National Forest. The Forest Service goal has been to provide habitat conditions that allow a reasonable number of elk to escape hunters so that MDFWP does not have to reduce the allowable harvest or shorten the hunting season (USDA 1986). Hunting pressure can affect both elk numbers and distribution and is partially determined by the hunting regulations (season length and structure – i.e. cow tags, either sex, brow-tined only, spikes, limited draw, etc.). The current 5-week season (longer than in most states and provinces) "permits a diversity of choice [for hunters] with regard to time, weather conditions, hunter density, and area" (Lonner and Cada 1982 cited in Hillis et al. 1991).

The State of Montana manages elk populations on an Elk Management Unit basis and establishes elk harvest regulations on a hunting district basis, which are sub-divisions of Elk Management Units (MDFWP 2004). Hunting districts are further sub-divided into EHUs, which are the units used by the HNF to analyze security under Standard 4(a) (USDA 1986, p. II/18).

Depending upon location, EHUs contain varying amounts of National Forest System land, which complicates elk security analyses for National Forest projects and limits the amount of influence management on National Forest System lands can actually have on overall security within an individual EHU and/or larger management unit. Elk may use habitat on private land differently where hunting pressure can be much different than that found on public land.

The Divide Travel Plan project area includes two elk management units (EMU) and their respective hunting districts (HD) as defined by the state-wide *Montana Final Elk Management Plan* (MDFWP 2004):

- Deerlodge EMU (HDs 215, 335)
- Granite Butte EMU (HDs 293, 343);

Table D.3 and Figure D.1 illustrate the nested relationship between these management and analysis units, and the varying amount of National Forest System lands within them.

Table D.3 Elk Management Units (EMU), Hunting Districts and Elk Herd Units (EHU) within the Divide Travel Project Area

EMU	**Hunting Districts containing NFS Land within the Project Area**	**Associated EHUs**
Deerlodge	215	Jericho[1], Spotted Dog/Little Blackfoot
	335	Black Mountain/Brooklyn Bridge, Greenhorn, Jericho[1], Spotted Dog/Little Blackfoot, Quartz
Granite Butte	293	Greenhorn, Jericho[1], Little Prickly Pear – Ophir, Spotted Dog/Little Blackfoot
	343	Black Mountain/Brooklyn Bridge, Greenhorn, Jericho[1], Little Prickly Pear-Ophir
[1] Elk Herd Units currently meeting Big Game Standard 4a (1)		

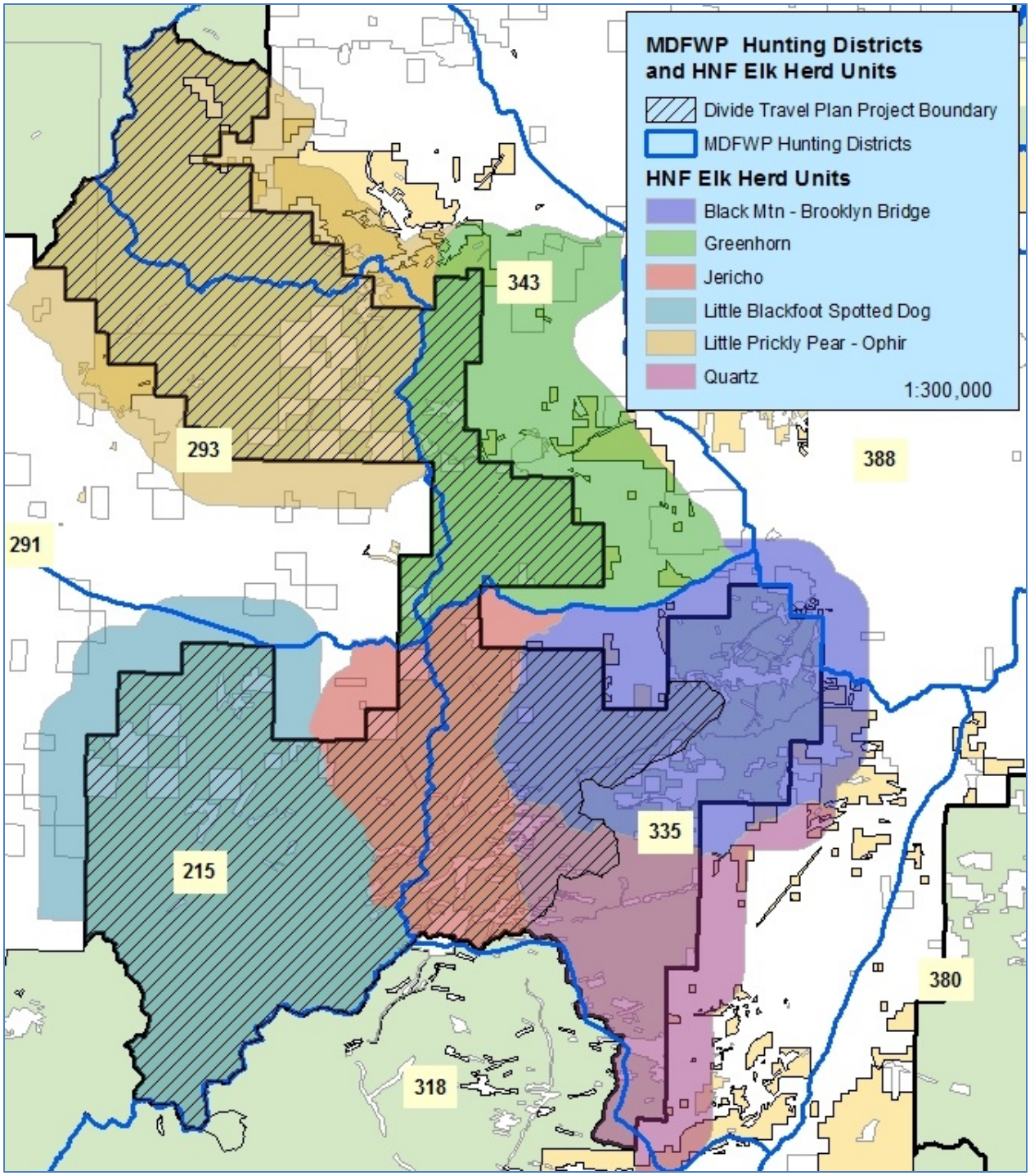

Figure D.1 MDFWP Hunting Districts and HNF Elk Herd Units associated with the Divide Travel Plan Project Area

Factors Influencing Elk Management

Each Elk Management Unit, and associated Hunting District(s), has its unique challenges that relate to management of elk. Although varied by Hunting District, overall challenges include the

impacts of predation on elk populations, the amount of public land in the Unit, the level of restricted hunting access on private land, and extent of motorized use. Refer to the *Montana Final Elk Management Plan* (MDFWP 2004) for more information. There are also inherent differences in habitat amongst EMUs.

Table D.4 provides information relative to MDFWP population objectives in the Hunting Districts overlapping the Divide Travel Plan project area. There are four hunting districts that overlap with the Plan area.

Table D.4 MDFWP population objectives and recent trend data in Hunting Districts that Overlap with the Helena National Forest

Hunting District[1]		Population Objectives Based on Aerial Surveys Post-Harvest (MDFWP 2004)	Recent Trend Data (Year of Data)	Summary
215	Number of Elk	1000 elk	2,493 (2013)	Elk numbers and bull/cow ratio above objectives. Management challenges in this HD include housing development and mining activity, access, extensive motorized use, and wolf establishment (MDFWP 2004, pp. 190-193).
	Bull/ Cow Ratios	10 bulls/100 cows	12 bulls/ 100 cows (2013)	
293	Number of Elk	750 elk	609 elk (2013)	Elk numbers below objectives, bull to cow ratio above objectives. Management challenges in this HD include development, access, noxious weeds, predation, and elk security in terms of cover and road densities (MDFWP 2004, pp. 197-198).
	Bull/ Cow Ratios	10 bulls/100 cows	13 bulls/100 cows (2013)	
335	Number of Elk	480-720 elk	827 elk (2013)	Elk numbers above objectives, bull/cow ratio below objectives. Management challenges in this HD include housing development and mining activity, extensive motorized use, and wolf establishment (MDFWP 2004, pp. 190-193).
	Bull/ Cow Ratios	10 bulls/100 cows	9 bulls/ 100 cows (2013)	
343	Number of Elk	560-840 elk	656 elk (2013)	Elk numbers and bull/cow ratio meets objective. Management challenges in this HD include

Hunting District[1]		Population Objectives Based on Aerial Surveys Post-Harvest (MDFWP 2004)	Recent Trend Data (Year of Data)	Summary
	Bull/ Cow Ratios	10 bulls/100 cows	10 bulls/100 cows (2013)	housing development, access, noxious weeds, predation, and elk security in terms of cover and road densities (MDFWP 2004, pp. 197-198).

Correlation between Standard 4(a) and Elk Numbers

As illustrated above in Tables D.2 and D.4, there is not a strong correlation between achievement of Forestwide Standard Big Game 4(a) within a particular EHU and the actual performance of the elk population within the relative Hunting District. For example, the Greenhorn EHU, which does not meet Standard 4(a), is located within HDs 293, 335, and 343. HD 293 is currently below population objectives for elk numbers and above for bull/cow ratio objectives while HD 335 is the opposite. Meanwhile, HD 343 meets both population objectives. Furthermore, management challenges as described in the *Montana Final Elk Management Plan* associated with HDs 293 and 343 include lack of security, among others, while those associated with HD 335 do not include a cover consideration. In other words, while cover is a concern in HDs 293 and 343 and the lack of cover in the Greenhorn EHU partially explains its inconsistency with Standard 4(a), HD 293 does not meet population objectives while HD 343 does. Conversely, HD 335 does not meet population objectives and lack of cover is not a management challenge in this HD. Another example includes the Jericho and Little Prickly Pear/Ophir EHUs; the Jericho EHU meets Standard 4(a) while the Little Prickly Pear/Ophir EHU does not. They are partially located within HD 293 which is below objectives in terms of elk numbers and above objectives in terms of the bull/cow ratio. A management challenge in this HD is cover. Compliance, or lack thereof, with standard 4(a) is not a good indicator of elk population performance given the patterns of land ownership and other factors affecting elk security and/or population levels.

Additionally some population metrics such as overall elk population levels may be as determined outside of the hunting season as by what happens during the hunting season. For example, body fat condition, pregnancy rates and recruitment into the population may be determined outside of the hunting season, but have dramatic effects on populations.

Recent Science Regarding Elk Management

The Forest Plan direction found in the original Helena National Forest Plan is 27 years old and does not reflect the subsequent 27 years of relevant science and data, changing issues with regards to elk, or changing elk numbers and distribution. The original Helena National Forest Plan standard for measuring elk security in the hunting season uses an index that combined open road density and hiding cover. While this relationship can be informative, it does not account for the spatial arrangement and size of unroaded patches, topography as a mediator of hunter access, the distribution of forage, and other factors that influence the ability of elk to survive the hunting season. Research since the crafting of the Helena Forest Plan emphasizes, among other factors, the effects of open motorized routes on elk security. For example, forest stands that do not meet the definition of hiding cover may prove to be secure areas for elk

where local conditions of topography, remoteness, and environmental barriers impede hunter access. Conversely, blocks of hiding cover situated in areas with high levels of motorized use may be highly insecure. Hiding cover has a role to play but it is not necessarily synonymous with security (Lyon and Canfield 1991; Unsworth and Kuck 1991; Lyon and Christensen 1992; Christensen *et al.* 1993, Stubblefield et al. 2006 p. 1068, Montgomery et al. 2013, p. 322, Proffitt et al. 2013).

In summary, the big game security index, as currently formulated, will be impossible to meet throughout most of—and possibly all of—the Divide landscape for the foreseeable future (25-50 years), not because of deficiencies in travel management, but because of the natural loss of hiding cover. The current standard also has an objective based on elk management metrics (% of bull harvest occuring during the first week of the general big game hunting season) that are no longer being collected by MDFWP. Additionally, despite the ongoing loss of cover, elk numbers continue to exceed the Forest Plan benchmark (6,400 elk by the year 2000), indicating that the link between cover on National Forest System lands and elk security, as reflected by stable or increasing elk populations and/or bull to cow ratios, is not as strong as envisioned when the Forest Plan was developed. As a result, attempts to implement the current standard are placing impractical constraints on Forest management and on the ability of the public to use the Forest, and may not be having the effect on elk as it was understood twenty eight years ago.

The Concept of Elk Security Areas

Big Game Standard 4a addresses big game security. It was developed in response to concerns about both big game habitat capability as well as hunting opportunity and to address one key factor in overall elk vulnerability during the hunting season – the proportion of bull elk harvest occurring during the first week of the (general) hunting season (USDA 1986 at II-17). Elk vulnerability during the hunting season is defined as *"a measure of elk susceptibility to being killed during the hunting season"* and is generally considered to be the opposite of security (Lyon and Christensen 1992, Stalling et al. 2002). It is a concept that is the sum of many factors including security, hunter opportunity, and elk behavior. Security is defined as *"the protection inherent in any situation that allows elk to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other human activity"* (Lyons and Christensen 1992, Stalling et al. 2002). Security is the result of a combination of factors that allow elk to remain in a specific area while under stress from hunting (Christensen et al. 1993). The components of security may include vegetation, topography, road density, size of vegetation blocks, and hunter density, among others (Lyon and Christensen 1992).

Lonner (1991) outlined three key aspects of elk vulnerability during the hunting season:

- Maintaining good habitat security that would protect elk from becoming easy prey during the hunting season;
- Preserving or recovering desired elk population characteristics and distributions in the face of intensifying land management practices; and
- Satisfying the growing demand for quality elk hunting and non-hunting experiences.

Thomas (1991) provided even more detail, stating that elk vulnerability during the hunting season, particularly of bull elk, during the hunting season, is consistently related to the following factors:

- Increasing densities of roads open to traffic hunter access and numbers;
- Increasing numbers and densities of hunters;
- Decreasing amounts of cover;
- Fragmentation of cover into smaller patches;
- No restrictions on bull harvest – i.e., all antlered animals are legal game;
- Setting of open seasons that include the rutting period;
- Improving "technology" of hunting including weapons, vehicles, calls, and training tools; and
- Longer hunting season;
- Relatively gentle terrain;
- Increasing number of hunter days.

Although the terms elk security and elk vulnerability during the hunting season are strongly related and are often used interchangeably, it is important to remember that they are actually inversely related – as security declines elk vulnerability during the hunting season increases (Stalling et al. 2002 – citing Youmans 1992).

In the Divide landscape (as on much of the HNF), elk security during the hunting season is an important determinant of elk abundance and population structure. While the ability of elk to survive the hunting season is influenced by a number of environmental circumstances, the status of the local Forest road system – and subsequent hunter access - is often the key factor (Proffitt et al. 2009). Several studies have documented the effect of roads on elk security, population structure, and hunter success (Edge and Marcum 1991; Leptich and Zager 1991; Unsworth and Kuck 1991; Gratson and Whitman 2000, Gucinski et al. 2001, Grigg 2007). While most studies demonstrate that open roads influence elk distribution during the hunting season and that road closures can lower the kill rate in a given area, at least one study indicates that in certain circumstances road closures do not alter hunter success (Burbridge and Neff 1976 cited in Gratson and Whitman 2000). In some cases, displacement of elk from roaded public land into more remote terrain (or to inaccessible private land) early in the hunting season can serve to depress the kill rate throughout the remainder of the season. Obviously hunting season and structure can have a direct effect on hunting pressure and the resulting situation for elk in addition to habitat management.

Since the release of the Helena Forest Plan in 1986, field research in Montana and Idaho has led to the concept of "elk security areas" as a basis for assessing elk vulnerability during the hunting season. The degree to which elk are able to survive the fall hunt is seen, in large part, to be a function of the size and pattern of habitat blocks, amply forested in some cases, to which hunter access is limited. Hillis and others (1991) developed an analysis procedure (generally referred to as the "Hillis method") based on the availability of large non-linear blocks of habitat (≥250 acres) at least ½ mile from open roads. As a rule of thumb, Hillis et al. recommended that at least 30% of the "hunting season home range" within a "standardized habitat analysis unit" be held in security areas (Hillis et al., p. 39). Hillis cautioned, however, that this set of parameters was designed for densely-forested western Montana elk habitat, and that—particularly for areas further eastward where forest cover may be limited—security requirements should be evaluated on a site-specific basis and the guidelines adjusted so that the results make biological sense in a local setting (Hillis et al. 1991, p. 40; Christensen et al. 1993, p. 5). The underpinnings

of this methodology – i.e. elk tend to avoid open motorized routes during the hunting season - has been well documented in the scientific literature and reinforced through the work of Unsworth and others (1991, 1993), Rowland and others (2000, 2005), and Proffitt and others (2013), to name just a few.

It's important to keep in mind that the Forest Plan Big Game Security standard (4a) was designed to address MDFWP elk objectives in place at the time of Forest Plan development and to support existing hunting regulations. These objectives were tallied up to a Forestwide level with the intent to provide habitat sufficient for 6,400 elk. The standard addressed the need for distribution of elk across the landscape by setting the standard at the herd unit level; however, the objectives were intended to be realized Forestwide. Also noteworthy is the fact that many of the Hunting Districts that overlap with the Helena National Forest are at or above population objectives set forth in the MDFWP 2004 Elk Management Plan (See Table D.4 and MDFWP aerial survey data in the project file).

Alternative Discussion

Alternative A – No Action Alternative

Alternative A, the No Action Alternative, is the existing Forest Plan Standard. In this case, 'no action' means no amendment to the existing Forest Plan. The analysis of effects associated with Alternative A describes the effects of the current Forest Plan standard. The exact language of the current standard is as follows:

Forestwide Standard Big Game 4(a) (USDA HFP pp. II/17 – II/18) *Road management will be implemented to at least maintain big game habitat capability and hunting opportunity. To provide for a first week bull elk harvest that does not exceed 40 percent of the total bull harvest, roads will be managed during the general big game hunting season to maintain open road densities with the following limits.*

Forest Plan Big Game Security Index		
Existing Percent Hiding Cover (1)	**Existing Percent Hiding Cover (2)**	**Max Open Road Density mi/mi^2**
56	80	2.4
49	70	1.9
42	60	1.2
35	50	0.1

(1) Forest Service definition - a timber stand which conceals 90 percent or more of a standing elk at 200 feet.
(2) MDFWP definition - a stand of coniferous trees having a crown closure of greater than 40 percent.

The existing hiding cover to open road density ratio should be determined over a large geographic area, such as a timber sale analysis area, a third order drainage, or an elk herd unit.

Alternative A is considered in detail in this analysis.

Alternative B

Alternative B was designed to address best science and local knowledge. It also expanded consideration to all open motorized routes (whereas Alternative A only applies to roads as

originally envisioned in the Forest Plan). Alternative B would replace the existing Forest Plan Big Game Standard 4(a). The Divide Travel Plan project area encompasses only about ¾ of the Divide landscape [portions of the Quartz, Black Mtn – Brooklyn Bridge, and Little Prickly Pear – Ophir EHUs falling into areas covered by previous travel management plans]; however, the proposed amendment applies to all portions of the herd units included in the Divide Travel Plan analysis. Under the Forest Plan amendment proposed for the Divide Travel Plan—and applicable to future projects in the Travel Plan Area—the "security area" approach replaces the "road density/hiding cover index" as the Forest Plan standard for gauging the vulnerability of elk to hunting. The amendment derives from the Hillis methodology (1991) and adopts specific guidelines for its application from *Recommendations for Big Game Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests* (MDFWP and USDA Working Group 2013). The exact language of the standard is as follows:

Standard

Implement an aggressive road management program to maintain or improve big game security. This will be accomplished in the Divide Landscape of the Helena National Forest by way of the following:

When security areas comprise more than 30% of that portion of an elk herd unit within the HNF administrative boundary, management activities shall not reduce the amount of security areas during the rifle season (approximately October 15 through December 1) to less than 30%. Where security areas comprise 30% or less of that portion of an elk herd unit within the HNF administrative boundary during the general rifle season, management activities shall not result in a further reduction.

Definition

Security Area – a block of big game habitat, 250 acres or larger, that is generally at least ½ mile from any open motorized route during the rifle big game hunting season (10/15 – 12/1).

Discussion

The Forest Plan Big Game Standard 4(a) - Alternative A - was crafted to provide big game security during the hunting season and largely reflected work by Lyon and others (1985) that was based on a focused road building and timber management program on National Forests in Montana. While this provision remains relevant – i.e. maintaining big game security during the hunting season - the method by which big game security is measured needs to be updated to reflect more recent scientific deliberations and to address shortfalls in the application of the current standard, primarily the fact that the current standard is not a particularly sensitive indicator of changing elk security conditions (See the *Purpose and Need and Background/Overview sections*.) To that end, Alternative B was developed to include consideration of recommendations outlined in the *U.S. Forest Service and Montana Department of Fish, Wildlife, and Parks Collaborative Overview and Recommendations for Elk Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests* (MDFWP and USDA Forest Service 2013).

Alternative B is based on the concept of identifiable security areas. Security areas are intended to reduce elk vulnerability during the elk hunting season, and to provide animals the opportunity to meet their biological needs without making large range movements (e.g. to private land where hunting is not allowed or to lower quality habitats) (Lyon and Canfield 1991). This also allows for a more ethical, fair chase hunting experience, and for the hunting public to

have the ability and real opportunity to effectively hunt and harvest a public resource on public lands.

The concept of security areas is embodied by the "Hillis paradigm", a paper compiled by Hillis et al. in 1991 as part of an elk vulnerability symposium. The basic tenets of security areas under the "Hillis paradigm" include areas at least ½ mile from an open motorized route and at least 250 acres in size. The authors cautioned that in some cases, distance from open routes and the size of security area blocks may need to be increased depending on local conditions. They also recommended that at least 30% of an analysis unit be comprised of security areas.

Although Hillis et al. (1991) define security as "non-linear blocks of hiding cover", they also suggest that effective security areas may consist of several different cover –types if the block is relatively un-fragmented. The studies considered by Hillis et al. were conducted in areas of contiguous forest cover. In their discussion of security areas, Christensen et al. (1993, pp. 4, 5) speak to the significance of cover in this equation and note that where cover is ubiquitous, security can be controlled by road management alone. They recommend that in the more naturally open elk habitat in central Montana cover considerations should extend beyond the hunting season and therefore be assessed at a landscape level (See also Edge et al. 1987). Their data suggest that "elk are less selective about the specific vegetative characteristics of coniferous cover and more responsive to the size of units, connectiveness with adjacent units, and the scale of cover on the landscape" (Lyon and Canfield as cited in Christensen et al. 1993, p. 5).

In contrast to the Hillis et al. study areas, the landscape on the Helena Ranger District tends to include open habitat and areas where forests and grasslands are interspersed in a mosaic pattern. As such, consideration of the quantity and quality of forested cover across the entire EHU would be better than defining security areas as "blocks of hiding cover". This would allow for recognition of those situations where a mosaic of forest and/or open habitats exists, but which operationally are secure. In addition, recent analyses of elk habitat selection during the hunting season in Montana (Proffitt et al. 2013) did not show a significant selection for security areas comprised totally of coniferous cover. In addition, the analysis by Proffitt and others showed that security areas as a variable in habitat selection during the hunting season are strongly related to the motorized route variable.

Avoidance of roads is presumed to be a behavioral response conditioned by vehicular traffic. Other factors, including better hiding cover and lower road standards, can be expected partially to mitigate the negative response by elk. However, the best method for attaining full use of habitat appears to be effective road closures (Lyons 1983, p. 4).

McCorquodale (2013), in his review of the scientific literature on elk and roads, concluded that recent data demonstrated empirically that elk distribution and habitat use are strongly influenced by road effects; high road densities and traffic levels predictably reduce elk use.

Hillis et al. only speak to "open roads" and "closed roads". They suggest that hunting pressure is concentrated along open roads, but that closed roads located within security areas may increase elk vulnerability by providing walking and shooting lanes. Unsworth and Kuck (1991) note that road closures may have varied effects on animal distribution and hunter use and success. They cite to several studies where road closures allowed elk to remain in more preferred sites for longer periods of time (Irwin and Peek 1979). Basile and Lonner (1979) reported that when vehicular travel was restricted, hunters spent more time walking, saw more elk, and had greater success and reported having a higher quality hunting experience. Based on these studies and

the recent review from McCorquodale (2013) on elk and roads, the Hillis et al. recommendation to “minimize” closed roads within security areas was deemed unnecessary.

Hillis et al. (1991) also recommend identifying security areas within the hunting season home range. In practice on the Helena Ranger District, elk have the potential, depending on weather and other conditions, to use the entire breadth of elevations within their home range during the big game archery and general rifle hunting seasons. Therefore, it is not necessary or possible to identify a consistently “separate” fall use area within an EHU.

Despite these specific recommendations, Hillis et al. emphasize that “strict adherence to the guidelines should be avoided” (Hillis et al. 1991). To that end, the parameters in Alternative B reflect the broader collaborations outlined in MDFWP and USDA Forest Service (2013).

The Hillis Paradigm was tested on the Bighorn National Forest which has landscape conditions similar to the eastside of the HNF but not necessarily within the Divide landscape, which resides both west and east of the Continental Divide under more favorable growing conditions. The Rocky Mountain Elk Foundation and Wyoming Game and Fish Department (described in Jellison 1998 and Wyoming Game and Fish Department 2004) attempted to modify the security parameters identified in Hillis et al. to include larger forested patches and greater distances from open roads. They found that few areas met the 30% security levels identified in Hillis et al., most likely due to the open nature of the landscape. They concluded that the 30% recommended threshold may not be applicable to some landscapes and that other factors need to be considered in determining if an area is secure (Jellison 1998, p. 5).

In the *U.S. Forest Service and Montana Department of Fish, Wildlife, and Parks Collaborative Overview and Recommendations for Elk Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests* MDFWP biologists advocated for a ‘hunting season’ that included the archery season as well as the general rifle season when analyzing elk security. They cited a consistent increase in the number of archery hunters (doubling between 1990 and present) (see also Proffitt et al 2013 and Griggs 2007) and subsequent increased levels of motorized use during the archery season. As currently designed, Alternative B only includes consideration of the 10/15 to 12/1 general rifle season in its analysis of security. Portions of the Divide landscape are heavily roaded with routes that are either outside of Forest Service jurisdiction or serve as primary access routes to the National Forest. Other portions are interspersed with private land. These conditions make a seasonal closure of 9/1 difficult to achieve. The objective of maintaining or enhancing elk presence on NFS lands so that elk are available to the hunting public on public land was considered in the determination of the specific parameters (block size, distance from motorized routes) used to identify security areas, in the percentage of the EHU dedicated to security areas, and in discussions involving hunting season related seasonal road closures.

Alternative B would confine the security analysis to that portion of the EHU that occurs within the HNF administrative boundary and includes private land within that confine. However, for the purposes of analyses and cumulative effects of activities, the herd unit would continue to serve as the basis for those analyses.

The size of the security areas reflects the relatively developed nature of much of the Divide landscape in terms of checkerboard ownership and roads. In order to adequately protect bull elk, reduce displacement to private land refuges during the hunting season, and obviate the need for a vegetative cover requirement, those areas > 250 acres in size more than ½ mile from an open motorized route were considered secure. Although cover is not required as part of a

security area definition, standards remain in place that will ensure hiding cover is provided during future management activities.

Because elk serve as an indicator species and often management for elk serves as a proxy for other big game species, the retention of other Forest-wide and Management Area big game cover standards will address cover needs of other species.

Findings Required by Laws, Regulations, and Policies

National Environmental Policy Act

Comparison of Alternatives

This section describes the effects of the two amendment alternatives (A and B) relative to the four Travel Plan alternatives (1-4). It discusses relative changes in the way elk security is enumerated between Alternatives A and B. Effects of the Travel Plan alternatives on other pertinent aspects of elk ecology and management are discussed in the DEIS.

Alternative A (Existing Condition)

Alternative A is the No Action Alternative, the current Forest Plan standard. Table D.5 summarizes the status of each EHU in the Divide Travel Plan project area by Travel Plan alternative relative to this index (Big Game Standard #4a (USDA 1986, p. II/17 – II/18).

Table D.5 Hiding cover, weighted open road density, and consistency with Forest Plan Big Game Standard 4(a), by Elk Herd Unit, under the Divide Travel Plan alternatives

Elk Herd Unit	**% Hiding Cover**	**Open Road Density (mi/mi²)**				**Complies with *Forest Plan* Big Game Standard 4(a)?**			
		Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Black Mountain – Brooklyn Bridge	52%	1.9	1.8	1.9	1.9	no	no	no	no
Greenhorn	30%	1.8	1.6	1.5	1.5	no	no	no	no
Jericho	65%	1.2	1.2	1.1	1.1	yes	yes	yes	yes
Little Prickly Pear—Ophir	46%	1.6	1.5	1.5	1.5	no	no	no	no
Quartz	45%	1.1	1.1	1.1	1.1	no	no	no	no
Spotted Dog – Little Blackfoot	59%	1.2	1.2	1.0	1.0	yes	yes	yes	yes

Only one of the 6 elk herd units (EHUs) in the Divide Travel Plan project area meets the hiding cover/ open road density standard (Big Game standard #4a: HFP, p. II-18) under current conditions. The EHU that meets the standard (Jericho) would continue to do so under each of the three Travel Plan action alternatives. Of the 5 herd units currently out of compliance with Standard 4(a), two would move closer to compliance under each of the action alternatives (because of lower open road densities) and two would remain unchanged.

Although open road densities would decrease in most EHUs under the action alternatives as compared to existing conditions (Alternative 1), application of the existing Big Game Standard 4(a) to the Travel Plan alternatives reveals no change relative to the existing standard. These proposed reductions in hunting season road access (with consequent benefits for elk) would not result in any of the sub-standard EHUs moving into compliance with standard 4(a). This illustrates the concern that the big game security index, as currently defined in the Forest Plan, is not a particularly sensitive indicator of changing elk security conditions. These EHUs would never be able to meet the existing standard as long as available cover is below the minimum 50% threshold. No amount of road management would improve that condition. Even though all the action alternatives are expected to maintain or improve existing elk security in each EHU through reductions in road densities, this improvement cannot be reflected in the simplistic yes/no results used to report compliance with the current standard. Furthermore, Alternative A does not provide a measure on how unroaded areas are distributed within a respective herd unit. Several authors describe the importance of distribution of large unroaded areas for security (e.g. Lyon et al. 1985, pp. 7-8; Lyon and Canfield 1991, pp. 104-105; Canfield 1991, pp. 50-51; Christensen et al. 1993 p. 4, 5; McCourquodale 2013, p. 9). Road density data alone does not address distribution of 'unroaded' areas.

Even if it were possible to close all of the roads in the project area (several miles of roads are outside of the Forest Service's jurisdiction), some of the concerns identified by MDFWP in the *Montana Final Elk Management Plan* (MDFWP 2004) would not be ameliorated especially in those HDs where access to elk is a management concern.

In a word, the hiding cover/ open road density index, as now formulated, is insensitive to real changes in elk security and it places impractical constraints on Forest management and on the ability of the public to use the Forest (even though the allowed use is not detrimental to elk security). The standard will be impossible to meet throughout most of—and possibly all of—the Divide landscape for the foreseeable future (25-50 years), not because of deficiencies in travel management, but because of natural loss of hiding cover.

<u>Alternative B – (Proposed Alternative)</u>

Alternative B utilizes the concept of the percentage of an area in security to enumerate the resulting elk security differences between the Travel Plan alternatives. The actual on-the-ground results regarding NFS road management and the changes in elk security are the same as under alternative A, only the method of describing those results has changed. Table D.6 displays total acres and percent of elk security as calculated under this alternative. The results apply only to that portion of the EHU that is within the administrative boundary of the Helena National Forest and are based on blocks greater than or equal to 250 acres located greater than or equal to ½ mile from motorized routes that are open during the hunting season (10/15 through 12/1). The table also displays how this security is arranged on the landscape, relative to the number of security blocks established under each Travel Plan alternative *(see maps at the end of this appendix)*.

Table D.6 Elk Security during the Hunting Season (10/15 – 12/1) under Alternative B by Travel Plan Alternative

Elk Herd Unit (Total Acres within Administrative Boundary)	Alt. 1			Alt. 2			Alt. 3			Alt. 4		
	Acres of Elk Security	# of Security Blocks[1]	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)	Acres of Elk Security	# of Security Blocks	% of EHU (within boundary)
Black Mountain – Brooklyn Bridge (35,873)	13983	2	39	13983	2	39	13983	2	39	13983	2	39
Greenhorn (21,693)	3433	4	16	7097	5	33	7419	5	34	7921	4	37
Jericho (29,363)	8753	3	30	6523	2	22	9333	3	32	9333	3	32
Little Prickly Pear - Ophir (59,310)	14204	3	24	17062	4	29	17062	4	29	17062	4	29
Quartz Creek (23,036)	7038	4	31	7038	4	31	7038	4	31	7038	4	31
Spotted Dog/ Little Blackfoot (63,561)	28800	5	45	27024	4	43	33046	3	52	31872	4	50

[1] The total number of Security Blocks reflects the actual number on the landscape. Some Security Blocks overlap EHU boundaries and are located within 2 or more EHUs

Table D.6 summarizes the current contribution of HNF lands to elk security. The methodology used to delineate the security areas is described in the Wildlife Specialist Report and includes consideration of topography, proximity to local population centers, travel corridors, and to a lesser extent cover. Although the proposed standard identifies 250 acres as the minimum patch size for security, in application only those blocks that were greater than 300 acres were considered secure.

As can be seen in Table D.6, elk security areas provide a means of gauging elk security that is sensitive to changes in open motorized route configuration. This allows a more realistic assessment as to potential impacts of travel management proposals in different herd units than the current HFP Standard (the Big Game Security index), which shows no difference between any of the alternatives in terms of Forest Plan compliance. The difference between the two methods is largely a function of eliminating hiding cover as a primary determinant of elk security and focusing on the size and distribution of large habitat blocks to which vehicle access is limited. This is particularly appropriate in this case, as Travel Plan alternatives deal with changes in open road patterns and generally have no impact on hiding cover. However, Forest Plan standards remain in place that recognize the importance of elk hiding cover (i.e. Forest-wide Big Game Standards 3, 5 and several management area specific standards – See Table D.1).

Among the three travel plan action alternatives, Alternatives 3 and 4 would generally serve to consolidate security areas into larger contiguous blocks resulting in an increase in total overall acres of security and a larger average size of security areas as compared to the existing condition. In turn, this could affect sex and age structure of elk as well as serve to retain more elk on public land. Improvements in elk security can reduce bull mortality and subsequently can improve bull:cow ratios (Leptich and Zager 1991, p. 129, 130).

Alternative Conclusions

Implementation of Alternative B should reduce and/or eliminate elk displacement from public land prior to normal migration events. This would address a primary management goal for MDFWP: maintaining or enhancing elk presence on NFS lands so that elk are available to the hunting public on public land. Several studies indicate that elk may find more complete security during hunting seasons by moving to private lands that restrict hunter access or prohibit hunting (Burcham et al. 1999, Proffitt et al. 2013). This response to hunting risk may result in elk herds that spend increasing amounts of time on privately owned lands and limit the ability to manage herd sizes through harvest (Haggerty and Travis 2006). Implementation of Alternative B could also lead to improvements in bull:cow ratios (Leptich and Zager, p. 129, 130). However, elk distribution can be affected through road management and establishment of security areas over time (Rowland et al. 2005 and McCorquodale 2003) in turn providing MDFWP the flexibility to achieve their population objectives.

Cumulative Effects of Other Forest Plan Amendments

Existing Amendments

There are currently 28 Forest Plan amendments of which five have had implications on Big Game standards. These five are described below.

Amendment #7 – this site-specific amendment exempts the Miller Mountain hard rock mineral exploration project (1993) from Forest Plan Big Game Standards 3 and 4(a). Approximately 590 acres were exempted from these standards associated with the construction of new roads and drill sites. Most likely, these roads do not provide hiding cover; however, they remain closed to

all use. There were additional closures in Jimmy's Gulch, an area adjacent to this 1993 project. The corporation that originally conducted mineral explorations in the area is no longer active.

Amendment #21 – this site-specific amendment exempted the Jimtown Project (2001) from Big Game Standard 4(a). The wildlife analysis concluded that the existing condition was not consistent with this standard. Effects associated with this project included the removal of approximately 3% of the hiding cover in the Hedges Mountain herd unit.

Amendment #23 – this site-specific amendment exempted the Cave Gulch Post-Fire Salvage Project from Big Game Standard 4(a). The wildlife analysis for this project indicated that the existing condition was not consistent with Standard 4(a). This was due in part to the loss of existing hiding cover from the Cave Gulch wildfire. Approximately 0.85 miles of temporary roads were built to implement the salvage sale and were subsequently decommissioned.

Amendment #26 – this site-specific amendment exempted the Fuels Reduction and Hazardous Tree Removal Project from Forest Plan Big Game Standards 3 and 4(a). The wildlife analysis for this project concluded that the existing condition for Forest Plan Standard 3 was not met within 17 of the 27 EHUs for hiding cover and none of the EHUs met Forest Plan Standard 3 for thermal cover. The existing condition for Forest Plan Standard 4(a) was not met within 22 of the 27 EHUs. Implementation of the Decision did not result in any additional EHUs being below these Forest Plan Standards. The Decision resulted in minimal reductions of hiding cover within those EHUs where existing conditions were already below Forest Plan Standard 3; a 1% reduction in two EHUs, and less than a 1% reduction in all other EHUs. Twenty two EHUs did not currently meet Forest Plan Standard 4(a). The open road densities however were not a part of this decision.

Amendment #28 exempts the Cabin Gulch Vegetation Treatment Project from the Forest Plan standards for hiding cover on summer range and the open road density standard during the hunting season (Big Game Standards 3 and 4(a) respectively, USDA 1986, p. II/17). Overall, this project will affect elk habitat to a limited extent by removing cover within the affected EHUs. Regardless of project implementation, this loss will occur naturally over the next few years due to extensive tree mortality and natural tree fall from the insect infestation. In addition, the selected treatments may be beneficial for elk over the current situation, as they could quicken the regeneration rate of new forests. The analysis concluded that through the life of the project and with the subsequent recovery of hiding cover over time, elk habitat will remain abundant and well distributed across the Forest. Approximately 2,313 acres of hiding cover will be removed in the Cabin Creek Herd Unit which is a reduction of 6% from the existing condition. Approximately 190 acres of hiding cover will be removed in the North Fork Herd Unit which is less than a 1% reduction from the existing condition.

The Cabin Gulch Project Decision did not result in any increases in open road density during the hunting season. However, due to the removal of hiding cover within the Cabin Creek and North Fork EHUs and because both EHUs are below Forest Plan Standard 4(a) in the existing condition, the Project Decision does not meet Standard 4(a) thresholds. Mitigation measures were included from the Montana Cooperative Elk-Logging Study that will minimize project-related disturbances.

<u>Proposed Amendments</u>

Blackfoot Non-winter Travel Plan

The Blackfoot Non-winter Travel Plan is currently in the analysis phase with an anticipated FEIS in the winter of 2014. As part of this process, the Forest would propose to programmatically

amend Forest Plan Big Game Standard 4(a) to reflect updated research. The proposed programmatic amendment is still in the development phase. It is anticipated that this amendment would improve our ability to effectively manage elk habitat.

Red Mountain Flume/Chessman Reservoir Project

This project is currently in the objection phase and a decision has not yet been rendered. A site-specific amendment was prepared to exempt the project from Forest Plan Standard 3 for hiding cover on summer range for the Quartz Creek herd unit only and to exempt the project from Forest Plan Standard 4(a) for both the Black Mountain-Brooklyn Bridge and Quartz Creek herd units. The proposed amendment is a site-specific amendment and is applicable only to implementation of the decision for the Red Mountain Flume/Chessman Reservoir Project.

Telegraph Vegetation Project

The Telegraph Vegetation Project area is approximately 23,669 acres in size and is located roughly 15 miles southwest of Helena, and 5 miles south from Elliston, Montana, in the Little Blackfoot drainage west of the Continental Divide. The purpose of the project is to be responsive to the mountain pine beetle outbreak in this area, recover economic value of dead and dying trees, promote desirable regeneration, reduce fuels and the risk of wildfire, and maintain diverse wildlife habitats. In order to meet the purpose and need, a site-specific amendment exempting the project from Forest Plan Standard Big Game Standards 3 and 4(a) may be required. This project is currently in the analysis phase.

Stonewall Vegetation Project

The Stonewall Vegetation Project area is approximately 24,010 acres in size and is located on the Lincoln Ranger District, approximately 4 miles north and west of the town of Lincoln, Montana. The purpose of the project is to improve vegetative composition and structure across the landscape that is diverse, resilient, and sustainable to wildfire and insects. In order to meet the purpose and need, a site-specific amendment exempting the project from Forest Plan Standard Big Game Standards 3 and 4(a) may be required. This project is currently in the analysis phase.

Cumulative Effects Conclusions

All of the Forest Plan Amendments described above with the exception of the Blackfoot Non-winter Travel Plan amendment have been or will be site-specific in time and space. None of the past amendments has resulted in significant impacts to elk; nor should the proposed site-specific amendments significantly impact elk. Cumulatively, effects to elk hiding cover from this and other site-specific Forest Plan amendments should not compromise the Forest's ability to provide habitat potential to meet Forest Plan elk population goals.

Elk will continue to be abundant across the Forest as evidenced by the increases in elk numbers since the incipience of the Forest Plan. Elk numbers have been increasing across the west and in Montana since the early to mid- 1900s. Statewide, post-season elk numbers increased from 8,000 in 1922 to 55,000 in 1978 to about 160,000 in 2004 (MDFWP pp. 4-5).

The HNF is located within several hunting districts identified by MDFWP (Figure D.1). The total number of elk that have been observed in these hunting districts through the 2013 aerial surveys is 14,289 (MDFWP aerial survey data). Some of these hunting districts barely overlap with the HNF. Discounting those HDs, the total number of elk that have been observed on and around the Forest is 10,727 – although this is probably an underestimate because elk that occur in the 'discounted' HDs do spend some time on the Forest. Nevertheless, the number of elk

associated with the HNF is well in excess of the 6,400 population target identified in the HNF Plan (USDA 1986, p. V/5).

The programmatic amendment associated with the Divide Travel Plan effort is intended to reflect updated research and would be beneficial in terms of the Forest's ability to manage elk habitat.

This programmatic amendment would have little cumulative long-term impacts to the long-term relationship with multiple-use goods and services or have a substantive impact on the land management plan or its resources when considered with site-specific amendments 7, 21, 23, 24 and 28.

National Forest Management Act

The National Forest Management Act (NFMA) provides that forest plans may be amended in any manner, but if the management direction results in a significant change in the plan, additional procedures must be followed.

In April 2012, the Forest Service adopted new planning regulations at 36 CFR 219, Subpart A and Subpart B, which replaced the final 2000 land management planning rule (2000 rule) as reinstated in the Code of Federal Regulations on December 18, 2009 (74 FR 67062). The 2012 rule includes a transition period during which plan amendments may be initiated under the provisions of the prior planning regulation for 3 years after May 9, 2012 and may be completed and approved under those provisions. This amendment is being completed under the provisions of the prior regulations. It is, however, subject to the objection process in 36 CFR 219 Subpart B (at 219.59(b)).

The 1982 regulations at 219.10(f) require the agency to determine whether or not a proposed amendment would result in a significant change in the plan. If the change resulting from the proposed amendment is determined to be significant, the same procedure as that required for development and approval of a plan shall be followed. If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, then the agency may implement the amendment following appropriate public notification and completion of the NEPA procedures.

Forest Service Manual section 1926.51 identifies factors to consider in determining whether an amendment is significant or non-significant for those plans using planning regulations in place before November 9, 2000.

Table D.7 Factors for consideration to determine amendment significance

Changes to the Land Management Plan That are Not Significant	**Management Standards 3 and 4(a) Exceptions**
1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.	This amendment would be consistent with the goals and objectives of the Forest Plan, including Forest-wide goals to maintain and improve the habitat over time to support big game and other wildlife species. (Forest Plan page II/1). The amendment would provide habitat to support viable populations of elk. Long term goals and objectives associated with other resource management such as vegetation

Changes to the Land Management Plan That are Not Significant	Management Standards 3 and 4(a) Exceptions
	management, grazing, and mineral management, are not expected to be significantly altered as a result of this amendment
2. Adjustments of management area boundaries of management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management.	The amendment would not adjust management area boundaries or management prescriptions.
3. Minor changes in standards and guidelines.	This amendment would provide for a change in management standards for big game in the project area. It would incorporate more recent science as well as input from Montana Fish, Wildlife and Parks, the state wildlife management agency. The amendment would provide a standard that more closely ties to direct impacts to elk security and is not as tied to vegetation conditions, which can be affected by many factors, including those related to climate change stressors.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.	This amendment would apply to other projects within the project area. It would provide an improved measure of security for big game and more management opportunities for achieving management prescriptions.
5. Actions that significantly alter the multiple-use goals and objectives for long-term land and resource management.	This amendment would not alter the long-term relationship between levels of multiple-use goods and services originally projected in the Forest Plan for wildlife habitat, Allowable Sale Quantity, or other resource outputs, nor would it have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

This amendment would not alter the long-term relationship between levels of multiple-use goods and services originally projected in the Forest Plan for wildlife habitat, Allowable Sale Quantity, or other resource outputs, nor would it have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Based on consideration of the four factors identified in the Forest Service Manual, 1926.51, and considering the Forest Plan in its entirety, amending Standard 4(a) of the Helena National Forest

Plan would not be a significant change under NFMA to the Helena Forest Plan. This amendment is fully consistent with, but further refines and clarifies the means to achieve, current Forest Plan goals and objectives.

Amending Standard 4(a) would not affect the Forest's ability to realize the elk population potential established in the Forest Plan. When the Forest Plan Record of Decision was signed in 1986, the selected alternative was E-1. Alternative E-1 established Forestwide elk population potential for summer and winter range. In 1986, the Forest Plan summer range elk potential was 6,300 elk; the winter range elk potential was 4,000 elk. By decade 5, summer range elk potential in the Forest Plan was projected at approximately 6,200 elk and winter range elk potential at 3,200 elk (Forest Plan Record of Decision page 13, Forest Plan FEIS pages II/56-60). Based on aerial survey data collected by MDFWP, there are at least 10,727 elk that have been observed on and around the Forest, in excess of the 6,400 population target identified in the HNF Plan (USDA 1986, p. V/5).

Further, this amendment would not preclude the Forest's ability to achieve the goals and objectives as outlined in the Forest Plan. The goal, to "maintain and improve the habitat over time to support big game and other wildlife species" (USDA 1986, p. II/1) is being achieved with the proposed new amendment as well as through the retention of other existing Forest Plan standards. Our objective, - "management will emphasize…the maintenance or enhancement of elk habitat..." (USDA 1986, p. II/4) – is also being realized for the same reasons.

We would also continue to achieve our objective of "ensuring that viable populations of existing…animal species are maintained" (USDA 1986, p. II/17). Elk habitat would remain abundant and well distributed across the Forest. It is anticipated that the Forest would retain security components necessary to maintain a viable and huntable elk population. However, while habitat (e.g. hiding cover) is important to the long term viability of elk populations, elk populations – and their viability - are more likely to be controlled by harvest than by limits in cover (Unsworth et al. 1993, Bender and Miller 1999, Biederbeck et al. 2001, Conard et al. 2012). However, standards would remain in place that provide for hiding cover considerations.

Furthermore, implementation of this project, and others for which Forest Plan amendments have been or could be applied, should not impede the ability of the Forest to maintain and/or improve big game security while providing for an extended hunting season – the intent of Standard 4(a). The metrics used by MDFWP to determine if elk objectives are being met indicate that in many cases the hunting districts that overlap with the Forest are at or above MDFWP objectives.

Endangered Species Act

The Endangered Species Act creates an affirmative obligation "…that all federal departments and agencies should seek to conserve endangered and threatened species" of fish, wildlife, and plants. Implementation of Alternative B, the amendment, would not affect listed or proposed species or critical habitat.

National Historic Preservation Act

This amendment is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction would comply fully with the laws and regulations that ensure protection of cultural resources. This plan direction would compliy with

the National Historic Preservation Act and other statues that pertain to the protection of cultural resources.

Clean Water Act

This amendment is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction would comply fully with the laws and regulations that ensure protection of water quality. This plan direction would comply with the Clean Water Act and other statutes that pertain to the protection of water quality.

Environmental Justice

Executive Order 12898 directs federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on low-income and minority populations. This plan direction would have no effect on low income or minority populations.

Summary and Conclusions

One of the objectives of the Divide Travel Plan is to avoid imposing outdated management direction contained in the *Helena Forest Plan* (USDA 1986) on the road and trail system of the Divide landscape. The argument for doing so with regard to big game security standards has been made in previous sections. This section condenses those rationale into a more compact format.

The Travel Plan is designed to maintain a road and trail system that provides the public with reasonable access to the National Forest and allows the Forest Service to manage the landscape with some efficiency, while, at the same time, buffering as much of the wildlife resource as possible from problems generated by motor vehicles and disruptive human presence in general. Part of the process of balancing the need for road access with the security requirements of big game animals entails developing a system of habitat assessment and management guidance that can accurately depict the security status of elk in a given area and appropriately address any problems detected. Experience with the Forest Plan over the last couple decades has led HNF wildlife biologists to conclude that elk security standards in the Plan [particularly big game standard 4a (USDA 1986, p. II/17 – II/18)] do not accurately reflect the habitat needs of elk during the hunting season and have required road closures that restrict travel but often do not improve elk security.

In particular:

- *Forest Plan* standard #4a (the big game security index) indicates that five of the 6 EHUs in the Divide landscape are deficient in elk security to the point that they do not meet the standard.
- Despite the fact that five out of 6 EHUs do not meet Forest Plan Standard 4(a), elk numbers have been steadily increasing since the crafting of the Forest Plan in 1986. Aerial survey data collected by Montana Department Fish, Wildlife, and Parks staff through 2011 indicate that there are at least 10,727 elk within the hunting districts that comprise the Helena National Forest. This is well above the 6400 benchmark identified in the Forest Plan.

- MDFWP data indicate that elk populations in the Divide landscape are either at or near population objectives of the *Montana Final Elk Management Plan* (2004) for the last several years for most of the HDs; or that management challenges are are only partially habitat related. That is, elk security is adequate in many HDs. The existing FP standard is not an accurate indicator of elk security.
- In spite of the fact that the Travel Plan alternatives close miles of routes to vehicle access during the hunting season, big game standard 4(a) indicates that there is no improvement in elk security in any unit.
- In several herd units, not even the closure of all roads managed by the Helena National Forest would be enough to meet standard 4(a). In 4 herd units, current hiding cover percentages require that all open roads, public and private, be closed in order to meet standard #4a. In a 4th herd unit approximately 140 miles of roads would need to be closed if the standard is to be met.. These requirements are impractical on a grand scale. And the HNF is put in the position of never being able to meet standard 4(a) in these herd units in the foreseeable future (even while elk continue to thrive).
- By introducing reasonably measurable criteria as part of the formula for gauging the level of security needed in a given herd unit, the new standard provides a more realistic means of guiding travel management on the National Forest.

In conclusion, Forest Plan big game standard 4(a) inaccurately depicts the nature of elk security in the Divide landscape, is insensitive to changing road densities, and places unnecessary and impractical constraints on travel management. Meanwhile, the more recently developed elk security area methodology provides a reasonably accurate picture of elk security across the landscape, is responsive to proposed changes in open road patterns, and correctly directs management to areas that need further attention.

Although this amendment would eliminate cover measurements as part of the determination of elk security, it would not change other elk or big game related standards relative to the analysis and maintenance of cover, notably Big Game Standards 1, 2, 3, and 5. Big Game Standards 4b thru 4h and 6 regarding road management activities would also still in effect.

Elk are a management indicator for commonly hunted species. As such, they are intended to be a bellwether of the effects of management activities on representative wildlife habitats with the objective of ensuring that viable populations of existing native and desirable non-native animal species are maintained. Current elk numbers are well above those established as benchmarks in the 1986 Forest Plan, benchmarks intended to ensure that elk remain viable and huntable on the Helena National Forest.

Maps

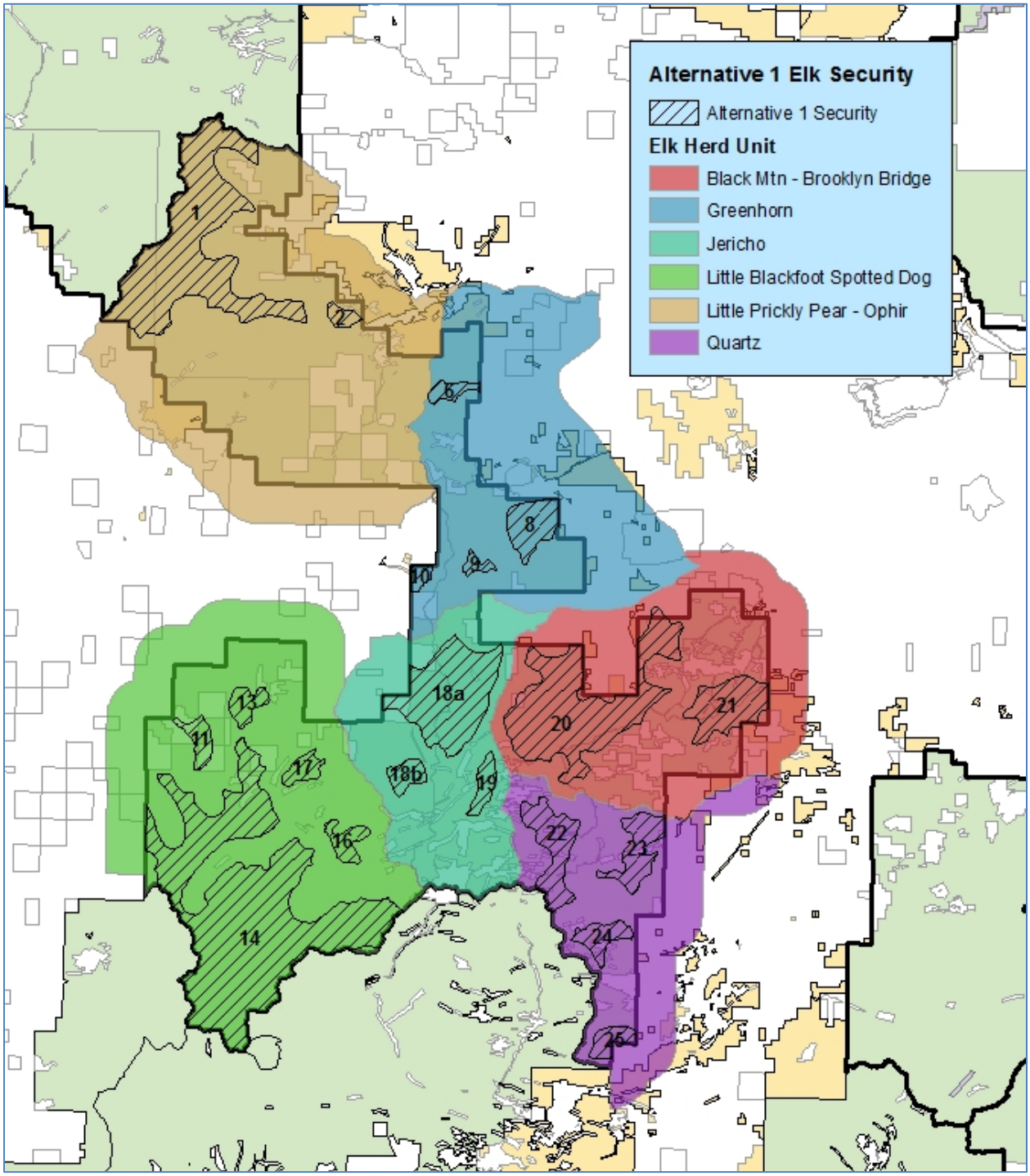

Figure D.2 Elk Security Alternative 1

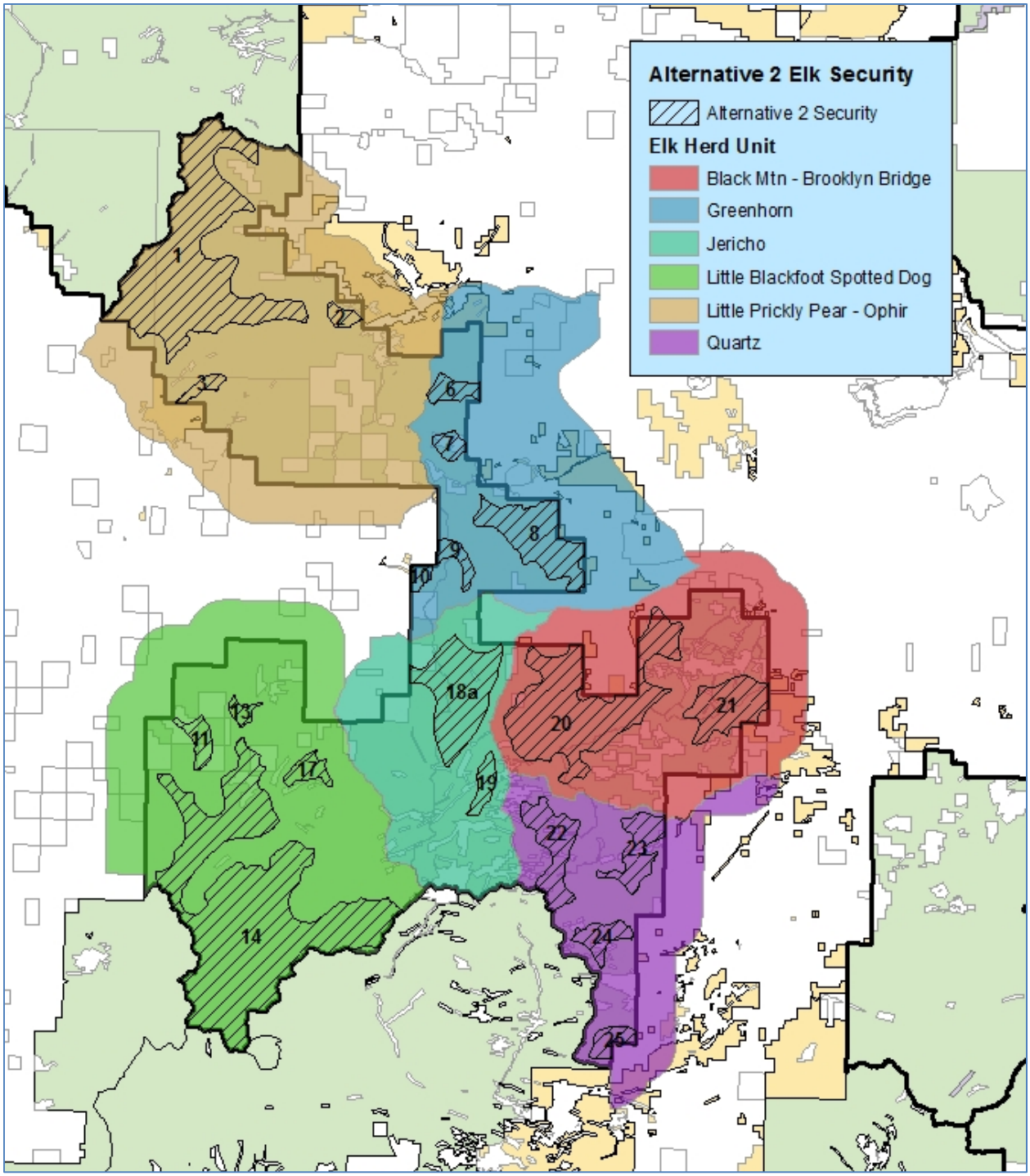

Figure D.3 Elk Security Alternative 2

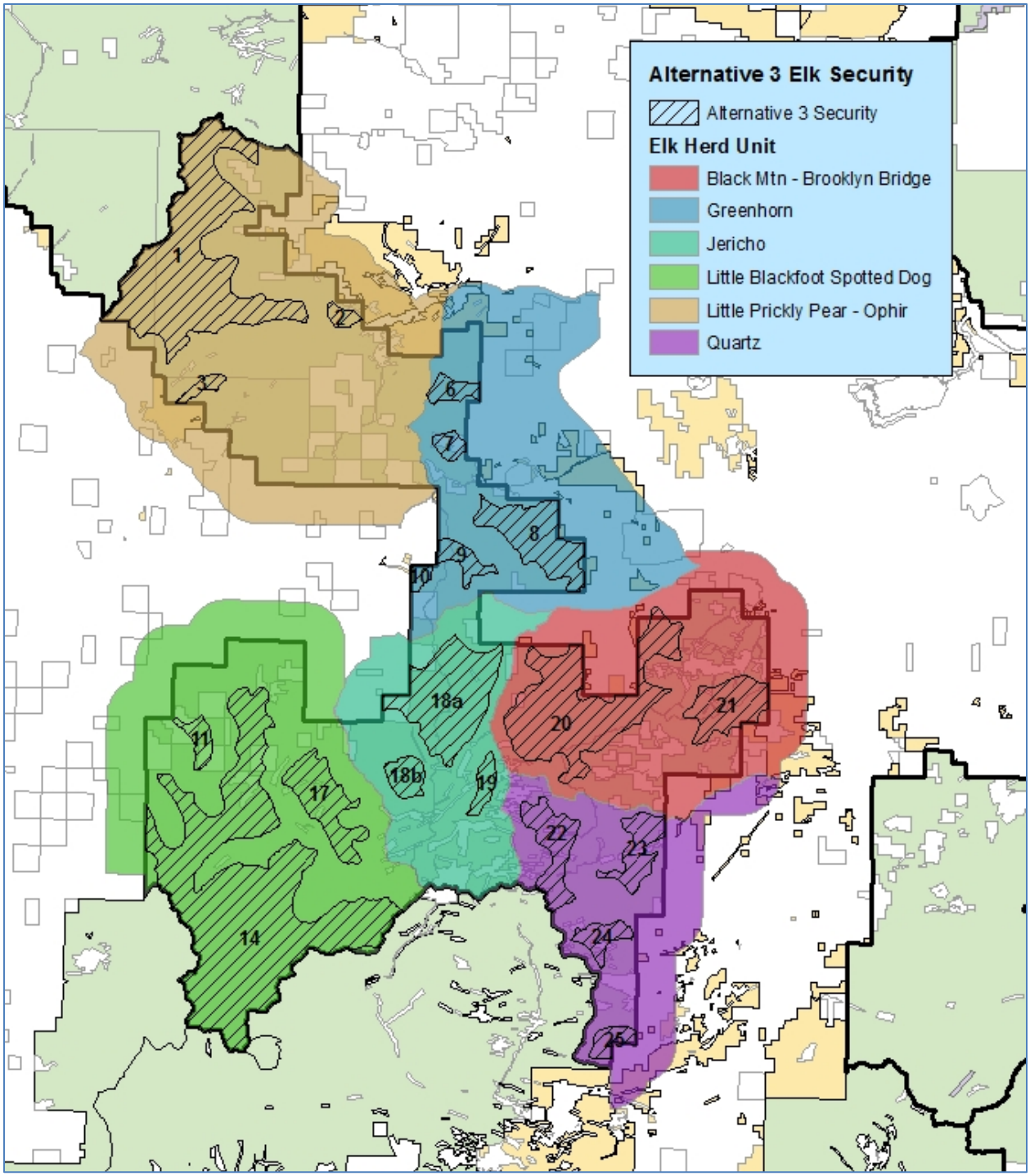

Figure D.4 Elk Security Alternative 3

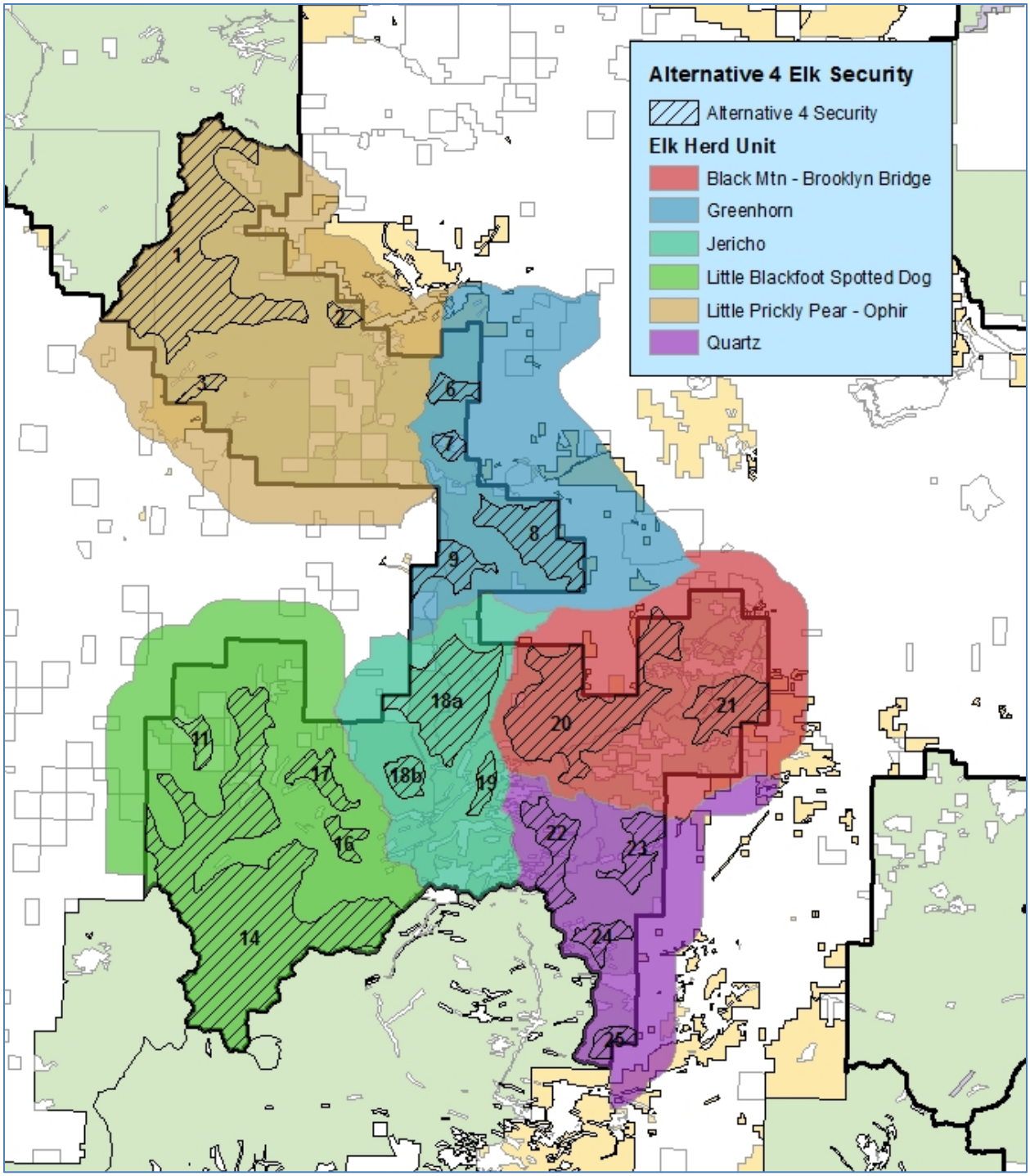

Figure D.5 Elk Security Alternative 4

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APPENDIX E. ROUTE BY ROUTE DESIGNATIONS

The following table describes the codes that are portrayed on the subsequent large table of routes by alternative. Please note that the term route refers to a trail or road.

Table E.1 Codes and Corresponding Descriptions

Table Codes	Description
01-RES	Roads closed to motorized vehicles yearlong, including over snow motorized vehicles (All Alternatives)
02-RES	Roads open to highway legal vehicles 12/2-10/14 (Alt 1) Open to over snow motorized vehicles12/2-10/14 (Alt 1)
03-RES	Roads open to highway legal vehicles 5/16-12/1 (All Alternatives) Open to over snow motorized vehicles 12/2-5/15 (Alt 2, 3 & 4)
05-RES	Roads open to highway legal vehicles 5/16-10/14 (Alt 2, 3, & 4) Open to over snow motorized vehicles 12/2-5/15 (Alt 2, 3, & 4)
06-RES	Roads closed to wheeled motorized vehicles yearlong (All Alternatives) Open to over snow motorized vehicles 12/2-10/14 (Alt 1) Open to over snow motorized vehicles 12/2-5/15 (Alt 2,3, 4)
06-RES-SPC	Open designated routes to over snow motorized vehicles 12/2-5/15 (Alt 2)
07-RES	Roads open to highway legal vehicles 10/15-12/1 (Alts 2 & 4) Open to over snow motorized vehicles 12/2-5/15 (Alts 2 & 4)
13-RES	Roads open to wheeled motorized vehicles 6/1-8/31 (Alt 1) Open to over snow motorized vehicles 12/1-8/31 (Alt 1)
15-RES	Roads open to wheeled motorized vehicles 5/16-4/14 (Alt 1) Open to over snow motorized vehicles, no seasonal restrictions (Alt 1)
M-07	Trails open to vehicles 50” or less in width, no seasonal restriction (Alt 1)
M-08.01	Continental Divide National Scenic Trail CDNST (All Alternatives)
MT	Trails open to vehicles 50” or less in width, no seasonal restrictions (Alt 2)
MT 5/16-10/14	Trails open to vehicles 50” or less in width 5/16-10/14 (Alt 2) (ATM MT 5/16-10/14)
MT-01-RES	Trails closed to motorized vehicles yearlong (ATM MT-01-Res)
NONMTR	Non-motorized system trail (All Alternatives) (ATM NOMTR)
NS-01-RES	Non-system roads, closed to motorized vehicles yearlong (Alt 2, Alt 3 and Alt 4)
OPEN-HWY LEGAL	Roads open to highway legal vehicles, no seasonal restrictions (All Alternatives) (OPEN-HWY-LEGAL)
UOPEN-HWY LEGAL	Open non-system roads & trails (Alt 1) (UOPEN-HWY-LEGAL)
PVT	Private road within project boundary
STATE	State Road
CO	County Road

Table E.2 Route-by-Route Comparison

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1016	0	0.694	0.694	15-RES	03-RES	03-RES	03-RES
1017	0	0.897	0.897	15-RES	03-RES	03-RES	03-RES
1017-A1	0	0.241	0.241	15-RES	03-RES	03-RES	03-RES
1041	0	0.46	0.46	01-RES	01-RES	01-RES	01-RES
123	0.7	3.005	2.305	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123	0.541	0.648	0.107	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
123	0	0.5	0.5	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123	0.5	0.541	0.041	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123	0.648	0.7	0.052	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123-013	0	0.11	0.11	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123-014	0	0.113	0.113	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123-017	0	0.043	0.043	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123-018	0	0.488	0.488	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
123-A1	0	0.282	0.282	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
123-A2	0	0.232	0.232	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136	17.304	18.196	0.892	CO	CO	CO	CO
136	3.5	5.9	2.4	CO	CO	CO	CO
136	0	3.5	3.5	CO	CO	CO	CO
136	8.705	16.94	8.235	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136	7.244	8.6	1.356	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136	5.9	7.244	1.344	CO	CO	CO	CO
136	16.94	17.304	0.364	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136	8.6	8.705	0.105	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136	18.196	20.26	2.064	CO	CO	CO	CO
136-007	0	1.277	1.277	UOPEN-HWY LEGAL	MT	NS-01-RES	MT 5/16-10/14

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
136-A1	0	1.14	1.14	01-RES	06-RES	06-RES	06-RES
136-A2	0	0.676	0.676	01-RES	06-RES	06-RES	06-RES
136-A3	0.05	0.162	0.112	01-RES	01-RES	01-RES	01-RES
136-A3	0	0.05	0.05	01-RES	06-RES	06-RES	06-RES
136-B1	0	0.671	0.671	01-RES	06-RES	06-RES	06-RES
136-B2	1.137	1.621	0.484	01-RES	01-RES	01-RES	01-RES
136-B2	0	1.137	1.137	01-RES	06-RES	06-RES	06-RES
136-B3	0	0.457	0.457	01-RES	06-RES	06-RES	06-RES
136-B4	0	0.138	0.138	01-RES	06-RES	06-RES	06-RES
136-B5	0	0.605	0.605	01-RES	06-RES	06-RES	06-RES
136-B7	0	0.241	0.241	01-RES	06-RES	06-RES	06-RES
136-B8	0	0.168	0.168	01-RES	06-RES	06-RES	06-RES
136-C1	0.5	2.538	2.038	01-RES	06-RES	06-RES	06-RES
136-C1	0	0.5	0.5	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136-C2	0	0.247	0.247	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136-C3	0	0.063	0.063	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136-D1	0.5	2.508	2.008	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
136-D1	0	0.5	0.5	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136-D2	0	0.242	0.242	01-RES	06-RES	06-RES	06-RES
136-E1	0	0.312	0.312	01-RES	06-RES	06-RES	06-RES
136-F1	0	0.468	0.468	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
136-G1	0	0.224	0.224	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1801	0	3.916	3.916	01-RES	06-RES	06-RES	06-RES
1801	3.916	4.105	0.189	01-RES	01-RES	01-RES	01-RES
1801-A1	0	1.458	1.458	01-RES	06-RES	06-RES	06-RES
1801-A1	1.458	3.107	1.649	01-RES	01-RES	01-RES	01-RES
1801-A2	0	0.396	0.396	01-RES	06-RES	06-RES	06-RES
1801-A3	0	0.788	0.788	01-RES	06-RES	06-RES	06-RES
1801-A4	0	0.523	0.523	01-RES	06-RES	06-RES	06-RES
1801-B1	0	0.442	0.442	01-RES	06-RES	06-RES	06-RES
1802	0	2.694	2.694	03-RES	03-RES	03-RES	01-RES
1802-A1	0	0.761	0.761	01-RES	01-RES	01-RES	01-RES
1802-B1	0	0.217	0.217	OPEN-HWY	06-RES	06-RES	06-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
				LEGAL			
1802-B2	0	2.041	2.041	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1802-C1	2.17	2.803	0.633	03-RES	03-RES	03-RES	01-RES
1802-C1	0.998	2.17	1.172	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1802-C1	0	0.998	0.998	03-RES	03-RES	03-RES	03-RES
1805	0	1.6	1.6	CO	CO	CO	CO
1805	1.6	6	4.4	CO	CO	CO	CO
1805	6	17.524	11.524	CO	CO	CO	CO
1805-001	0	0.107	0.107	UOPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-A1	0	1.193	1.193	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1805-A2	0	0.365	0.365	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1805-B1	0	0.803	0.803	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-B2	0	0.297	0.297	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-B2	0.297	1.315	1.018	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1805-B3	0	0.256	0.256	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-B3	0.256	0.509	0.253	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1805-C1	0	0.466	0.466	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1805-C1	0.466	0.771	0.305	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-C2	0.185	0.259	0.074	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-C2	0	0.185	0.185	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1805-C3	0	0.112	0.112	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1805-D1	0	0.207	0.207	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-D3	0	0.266	0.266	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-D4	0	0.3	0.3	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1805-E1	0	0.463	0.463	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1805-E1	0.463	1.407	0.944	OPEN-HWY LEGAL	01-RES	01-RES	01-RES
1811	0	1.734	1.734	01-RES	06-RES	06-RES	06-RES
1813	0	1.516	1.516	01-RES	01-RES	01-RES	01-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1813-C1	0	0.485	0.485	01-RES	01-RES	01-RES	01-RES
1836	0	1.274	1.274	06-RES	06-RES	06-RES	06-RES
1836-A1	0	0.097	0.097	06-RES	06-RES	06-RES	06-RES
1845	0.448	0.645	0.197	01-RES	06-RES	01-RES	01-RES
1846	0	1.613	1.613	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1849	0.819	4.351	3.532	01-RES	06-RES	06-RES	06-RES
1849	0	0.819	0.819	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1849-A1	0	2.388	2.388	01-RES	06-RES	06-RES	06-RES
1850	0	1.204	1.204	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1851	0	0.905	0.905	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1851	0.905	1.039	0.134	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1851	1.039	1.256	0.217	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1852	0	1.257	1.257	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1852	1.257	2.866	1.609	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1852-A1	0	2.003	2.003	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1852-B1	0	0.688	0.688	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1852-C1	0	0.911	0.911	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1852-C2	0	0.568	0.568	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1852-D1	0	0.506	0.506	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1852-D2	0	0.351	0.351	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853	0	1.886	1.886	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-A1	0	1.456	1.456	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1853-B1	0	0.391	0.391	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-B3	0	0.319	0.319	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-B4	0	0.319	0.319	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1853-C1	0	1.312	1.312	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-C3	0	0.51	0.51	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1853-D1	0	0.823	0.823	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-D2	0	0.336	0.336	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1853-E1	0	1.2	1.2	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-E3	0	0.1	0.1	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1853-E3	0.1	0.397	0.297	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1854	0	1.404	1.404	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1854-A1	0	0.672	0.672	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	2.918	3.173	0.255	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	5.774	6.447	0.673	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	6.447	6.503	0.056	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	2.241	2.32	0.079	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	0	0.8	0.8	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	2.32	2.918	0.598	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	0.8	2	1.2	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	3.819	4.37	0.551	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	4.37	5.774	1.404	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	2	2.241	0.241	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	3.173	3.819	0.646	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855	6.503	7.088	0.585	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-001	0	0.568	0.568	UOPEN-HWY LEGAL	06-RES	06-RES	06-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1855-002	0	0.476	0.476	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-004	0	0.802	0.802	UOPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-A1	0	1.667	1.667	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-A2	0	1.037	1.037	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-A3	0	0.633	0.633	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-A3	0.633	0.7	0.067	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1855-A4	0.181	0.267	0.086	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1855-A4	0	0.181	0.181	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1855-A5	0	0.797	0.797	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-B1	0	0.912	0.912	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-B2	0	1.283	1.283	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-B3	0	0.285	0.285	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-B4	0	0.34	0.34	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-B5	0	0.18	0.18	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-B6	0	0.183	0.183	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-B7	0	0.07	0.07	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-C1	0	1.155	1.155	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-C2	0	1.081	1.081	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-C3	0	2.174	2.174	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-C4	0	1.377	1.377	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-C5	0	0.377	0.377	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1855-D1	0	0.334	0.334	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-E1	0	0.421	0.421	OPEN-HWY LEGAL	06-RES	06-RES	06-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1855-F1	0	0.169	0.169	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1855-G1	0	0.487	0.487	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1856	7.704	9.488	1.784	06-RES	06-RES-SPC	06-RES	06-RES
1856	3.683	7.704	4.021	06-RES	07-RES	06-RES	06-RES
1856	0	3.683	3.683	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1856-B1	0	0.586	0.586	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1856-C1	0	2.2	2.2	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1856-D1	0	2.158	2.158	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1856-D2	0	0.157	0.157	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1856-E1	0	0.689	0.689	06-RES	06-RES	06-RES	06-RES
1856-F1	0	1.185	1.185	06-RES	06-RES	06-RES	06-RES
1856-G1	0.957	1.921	0.964	06-RES	06-RES	01-RES	01-RES
1856-G1	0	0.957	0.957	06-RES	06-RES	06-RES	06-RES
1856-H1	0	1.396	1.396	06-RES	06-RES	01-RES	01-RES
1856-I1	0	0.244	0.244	06-RES	06-RES	06-RES	06-RES
1856-J1	0	1.081	1.081	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1857	0.795	4.455	3.66	15-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1857	0	0.7	0.7	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1857	0.7	0.795	0.095	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1857-008	0	0.707	0.707	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
1857-A1	0.604	3.739	3.135	01-RES	05-RES	05-RES	05-RES
1857-A1	3.739	4.087	0.348	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1857-A1	0	0.604	0.604	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1857-A2	0	1.121	1.121	01-RES	06-RES	06-RES	06-RES
1857-A3	0	0.712	0.712	01-RES	06-RES	06-RES	06-RES
1857-A4	0	0.772	0.772	01-RES	06-RES	06-RES	06-RES
1857-A5	0	0.974	0.974	01-RES	06-RES	06-RES	06-RES
1857-B1	0.91	1.307	0.397	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1857-B1	1.307	1.4	0.093	15-RES	06-RES	06-RES	06-RES
1857-B1	1.449	1.455	0.006	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1857-B1	1.455	1.967	0.512	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES	OPEN-HWY LEGAL
1857-B1	0	0.91	0.91	15-RES	06-RES	06-RES	06-RES
1857-B1	1.4	1.449	0.049	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1857-B2	0	0.627	0.627	06-RES	06-RES	06-RES	06-RES
1857-B3	1.22	1.506	0.286	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES	OPEN-HWY LEGAL
1857-B3	1.13	1.22	0.09	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1857-B3	0.078	1.13	1.052	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES	OPEN-HWY LEGAL
1857-B3	0	0.078	0.078	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1857-B4	0	0.687	0.687	06-RES	06-RES	06-RES	06-RES
1857-B5	0	0.361	0.361	06-RES	06-RES	06-RES	06-RES
1857-C1	0	0.319	0.319	06-RES	06-RES	06-RES	06-RES
1857-D1	0	1.962	1.962	06-RES	OPEN-HWY LEGAL	06-RES	06-RES
1857-D2	0	0.65	0.65	06-RES	OPEN-HWY LEGAL	06-RES	06-RES
1857-D3	0	0.336	0.336	06-RES	06-RES	06-RES	06-RES
1857-D4	0	0.084	0.084	06-RES	06-RES	06-RES	06-RES
1857-D5	0	0.1	0.1	06-RES	06-RES	06-RES	06-RES
1857-E1	0	0.513	0.513	06-RES	06-RES	06-RES	06-RES
1857-F1	0	0.419	0.419	06-RES	06-RES	06-RES	06-RES
1857-G1	0	0.345	0.345	06-RES	06-RES	06-RES	06-RES
1857-G2	0	0.222	0.222	06-RES	06-RES	06-RES	06-RES
1857-G3	0	0.099	0.099	06-RES	06-RES	06-RES	06-RES
1859	1.8	3.686	1.886	06-RES	OPEN-HWY LEGAL	06-RES	06-RES
1859	0	1.8	1.8	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1859	3.686	5.309	1.623	06-RES	06-RES	06-RES	06-RES
1859-B1	2.179	2.248	0.069	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1859-B1	0	2.179	2.179	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1859-B2	0	0.15	0.15	06-RES	06-RES	06-RES	06-RES
1859-D1	0	0.764	0.764	06-RES	06-RES	06-RES	06-RES
1859-D2	0	0.414	0.414	06-RES	06-RES	06-RES	06-RES
1859-D3	0	0.222	0.222	06-RES	OPEN-HWY	06-RES	06-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
					LEGAL		
1859-D4	0	1.03	1.03	06-RES	OPEN-HWY LEGAL	06-RES	06-RES
1859-E1	0	0.4	0.4	01-RES	OPEN-HWY LEGAL	06-RES	06-RES
1859-E1	0.4	1.687	1.287	01-RES	OPEN-HWY LEGAL	06-RES	06-RES
1859-E2	0	0.185	0.185	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES	06-RES
1859-F1	0	1.054	1.054	01-RES	06-RES	06-RES	06-RES
1859-G1	0	0.09	0.09	06-RES	06-RES	06-RES	06-RES
1860	1.073	2.32	1.247	OPEN-HWY LEGAL	MT 5/16-10/14	01-RES	MT-01-RES
1860	0.721	1.073	0.352	OPEN-HWY LEGAL	MT 5/16-10/14	01-RES	01-RES
1860-A1	0	0.233	0.233	OPEN-HWY LEGAL	01-RES	01-RES	01-RES
1863	0.46	0.791	0.331	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863	0.791	6.465	5.674	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863	0	0.46	0.46	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863	6.465	7.015	0.55	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1863-A1	0	1.329	1.329	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863-B1	0	0.174	0.174	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863-C1	0	0.276	0.276	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863-E1	0	0.76	0.76	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863-F1	0	0.968	0.968	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863-G1	0.948	1.034	0.086	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1863-G1	0	0.948	0.948	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1863-H1	0	0.262	0.262	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1864	0.256	1.585	1.329	01-RES	01-RES	01-RES	01-RES
1864	3.491	4.901	1.41	01-RES	01-RES	01-RES	01-RES
1864	1.687	3.491	1.804	01-RES	01-RES	01-RES	01-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1864	0	0.256	0.256	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1864	1.585	1.687	0.102	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1864-A1	0	0.277	0.277	01-RES	01-RES	01-RES	01-RES
1866	0	0.106	0.106	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1868	0	1.385	1.385	13-RES	MT 5/16-10/14	06-RES	06-RES
1869	0	3.076	3.076	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1869-A1	0	0.374	0.374	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1869-B1	0	2.607	2.607	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	3.008	3.275	0.267	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	2.802	3.008	0.206	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	3.275	3.521	0.246	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	0	0.776	0.776	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	5.79	7.342	1.552	13-RES	05-RES	06-RES	05-RES
1870	4.226	5.79	1.564	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	1.876	2.364	0.488	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	2.364	2.802	0.438	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	3.521	4.226	0.705	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870	0.776	1.876	1.1	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1870-A1	0	0.972	0.972	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
1870-B1	0	0.424	0.424	01-RES	06-RES	06-RES	06-RES
1870-C1	0	0.342	0.342	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871	3.688	4.914	1.226	01-RES	06-RES	06-RES	06-RES
1871	3.098	3.688	0.59	01-RES	MT 5/16-10/14	06-RES	06-RES
1871	3.089	3.098	0.009	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871	0	3.089	3.089	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1871-002	0	0.813	0.813	UOPEN-HWY LEGAL	MT 5/16-10/14	06-RES	06-RES
1871-A1	0	1.446	1.446	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871-A1	1.446	2.84	1.394	01-RES	MT 5/16-10/14	06-RES	06-RES
1871-A2	0	0.735	0.735	01-RES	06-RES	06-RES	06-RES
1871-A3	0	0.648	0.648	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871-A3	0.648	1.137	0.489	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1871-A3	1.137	2.542	1.405	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871-A3	2.542	3.358	0.816	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871-A4	0	0.218	0.218	01-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871-A5	0	0.468	0.468	01-RES	06-RES	06-RES	06-RES
1871-A6	0	0.09	0.09	01-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1871-B1	0	0.716	0.716	01-RES	06-RES	06-RES	06-RES
1871-B2	0	0.301	0.301	01-RES	06-RES	06-RES	06-RES
1871-C1	0	0.989	0.989	01-RES	06-RES	06-RES	06-RES
1876	2.165	2.454	0.289	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	3.79	4.3	0.51	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	1.11	1.544	0.434	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	2.454	2.66	0.206	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	4.3	5.696	1.396	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	1.072	1.11	0.038	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	0	0.2	0.2	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	3.47	3.79	0.32	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	0.2	0.4	0.2	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	0.4	1.072	0.672	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876	2.66	3.47	0.81	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1876	1.544	2.165	0.621	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-A1	1.804	2.064	0.26	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-A1	0	1.597	1.597	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-A1	2.064	2.28	0.216	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-A1	1.597	1.804	0.207	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-B1	0	0.259	0.259	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-B1	1.999	2.849	0.85	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-B1	3.077	3.133	0.056	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-B1	3.133	3.436	0.303	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-B1	2.849	3.077	0.228	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-B1	0.259	1.216	0.957	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-B1	1.216	1.9	0.684	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-B1	1.9	1.999	0.099	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-B3	0.085	0.36	0.275	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-B3	0	0.085	0.085	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-C1	0.273	0.856	0.583	06-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-C1	0	0.273	0.273	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-D1	0	0.289	0.289	06-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-E1	0.099	0.574	0.475	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-E1	0	0.099	0.099	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
1876-F1	0	0.007	0.007	06-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-F1	0.007	0.177	0.17	06-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1876-F1	0.177	0.257	0.08	06-RES	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1880	0.229	0.518	0.289	01-RES	01-RES	01-RES	01-RES
1880	0	0.229	0.229	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
1896	0	0.259	0.259	OPEN-HWY	OPEN-HWY	OPEN-HWY	OPEN-HWY

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
				LEGAL	LEGAL	LEGAL	LEGAL
1897	0	0.524	0.524	OPEN-HWY LEGAL	01-RES	01-RES	01-RES
1898	0	0.1	0.1	01-RES	01-RES	01-RES	01-RES
218	0	6.759	6.759	CO	CO	CO	CO
218-A1	0.129	0.435	0.306	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
218-A1	0	0.129	0.129	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
218-A2	0.016	0.41	0.394	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
218-A2	0	0.016	0.016	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
218-B1	0	0.167	0.167	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
227	6.995	12.83	5.835	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
227	5.156	6.304	1.148	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
227	4.389	4.439	0.05	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
227	4.439	5.156	0.717	CO	CO	CO	CO
227	6.304	6.995	0.691	CO	CO	CO	CO
227	0	3.959	3.959	CO	CO	CO	CO
227	4.374	4.389	0.015	CO	CO	CO	CO
227	3.959	4.374	0.415	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
227-A1	0	0.243	0.243	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
227-A2	0.467	2.263	1.796	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
227-A2	0	0.467	0.467	01-RES	06-RES	06-RES	06-RES
227-A3	0	1.07	1.07	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
227-A4	0	1.037	1.037	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
227-B1	0	0.95	0.95	01-RES	06-RES	06-RES	06-RES
227-B1	0.95	1.662	0.712	01-RES	06-RES	06-RES	06-RES
227-C1	0.313	0.852	0.539	01-RES	06-RES	06-RES	06-RES
227-C1	0	0.313	0.313	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
227-D1	0.1	0.4	0.3	OPEN-HWY LEGAL	01-RES	01-RES	OPEN-HWY LEGAL
227-D1	0	0.1	0.1	OPEN-HWY LEGAL	OPEN-HWY LEGAL	01-RES	OPEN-HWY LEGAL
227-E1	0	0.905	0.905	OPEN-HWY LEGAL	OPEN-HWY LEGAL	01-RES	01-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
256	0	1.663	1.663	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299	0.995	5.756	4.761	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299-A1	0	0.765	0.765	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299-B1	0	1.355	1.355	01-RES	01-RES	01-RES	01-RES
299-C1	0	0.468	0.468	01-RES	01-RES	01-RES	01-RES
299-D1	0	0.577	0.577	01-RES	01-RES	01-RES	01-RES
299-E1	0	0.427	0.427	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299-F1	0.061	1.697	1.636	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
299-F1	0	0.061	0.061	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299-F2	0	0.343	0.343	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
299-F3	0	0.371	0.371	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
299-H1	1.156	1.52	0.364	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299-H1	0.999	1.156	0.157	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
299-H1	0	0.999	0.999	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
299-I1	0	0.428	0.428	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314	0	0.425	0.425	CO	CO	CO	CO
314	0.425	18.306	17.881	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314	18.306	23.484	5.178	13-RES	05-RES	06-RES	05-RES
314-006	0	0.862	0.862	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-A1	0	0.787	0.787	01-RES	OPEN-HWY LEGAL	06-RES	06-RES
314-B1	0	1.511	1.511	01-RES	06-RES	06-RES	06-RES
314-D1	0	0.607	0.607	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-E1	0	3.034	3.034	01-RES	OPEN-HWY LEGAL	06-RES	06-RES
314-E2	0	0.756	0.756	01-RES	06-RES	06-RES	06-RES
314-F1	0	0.565	0.565	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-G1	0	1.187	1.187	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-G2	0	0.765	0.765	OPEN-HWY	OPEN-HWY	OPEN-HWY	OPEN-HWY

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
				LEGAL	LEGAL	LEGAL	LEGAL
314-G3	0	0.515	0.515	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-H1	0	0.664	0.664	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-I1	1.511	2.419	0.908	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
314-I1	0	1.511	1.511	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-I2	0	0.397	0.397	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-J1	0	4.279	4.279	02-RES	OPEN-HWY LEGAL	06-RES	06-RES
314-J3	0	3.321	3.321	02-RES	07-RES	06-RES	06-RES
314-J3	3.321	4.944	1.623	06-RES	06-RES	06-RES	06-RES
314-J5	0	0.485	0.485	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-K2	0	0.295	0.295	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-L1	0	0.61	0.61	01-RES	06-RES	06-RES	06-RES
314-M1	0	0.152	0.152	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
314-M2	0	0.196	0.196	06-RES	01-RES	06-RES	06-RES
328	0	2	2	NOMTR	NOMTR	NOMTR	NOMTR
329	0	7.7	7.7	NOMTR	NOMTR	NOMTR	NOMTR
335	6.359	8.143	1.784	CO	CO	CO	CO
335	2.026	2.514	0.488	CO	CO	CO	CO
335	2.514	6.359	3.845	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
335	1.862	2.026	0.164	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
335	0	1.357	1.357	CO	CO	CO	CO
335	1.357	1.617	0.26	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
335	1.617	1.862	0.245	CO	CO	CO	CO
335-A1	0	1.208	1.208	06-RES	07-RES	06-RES	07-RES
335-A2	0	1.369	1.369	06-RES	07-RES	06-RES	07-RES
335-B1	0	0.396	0.396	06-RES	06-RES	06-RES	06-RES
335-B2	0	1.8	1.8	06-RES	06-RES	06-RES	06-RES
337	0	56.094	56.094	M-08.01	M-08.01	M-08.01	M-08.01
348	0	3.62	3.62	NOMTR	NOMTR	NOMTR	NOMTR
359	0	4.3	4.3	NOMTR	NOMTR	NOMTR	NOMTR
362	0	3.5	3.5	NOMTR	NOMTR	NOMTR	NOMTR

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
371	0	0.087	0.087	NOMTR	NOMTR	NOMTR	NOMTR
375	0	1.1	1.1	NOMTR	NOMTR	NOMTR	NOMTR
4005	0	4.422	4.422	CO	CO	CO	CO
4005	4.422	5.394	0.972	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005	5.394	6.377	0.983	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005	6.377	8.301	1.924	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-001	0	1.721	1.721	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-002	0	0.934	0.934	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-003	0	0.607	0.607	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-004	0	0.071	0.071	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-005	0	0.724	0.724	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-006	0	0.309	0.309	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-007	0	0.028	0.028	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-008	0	0.33	0.33	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A1	0	5.725	5.725	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A2	0	0.746	0.746	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A3	0	3.164	3.164	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A4	0	0.754	0.754	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A5	0	0.125	0.125	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A6	0	0.261	0.261	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-A7	0	0.064	0.064	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-C1	0	0.714	0.714	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-D1	0	1.112	1.112	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
4005-D1	1.112	1.155	0.043	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-E1	0.729	1.591	0.862	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-E1	0	0.016	0.016	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4005-E1	0.016	0.729	0.713	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
4005-E2	0	0.64	0.64	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4006	0	0.28	0.28	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
4006	1.856	4.265	2.409	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4006	0.28	1.856	1.576	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
4006-005	0	0.408	0.408	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4006-A1	0	1.148	1.148	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4006-B1	0	1.052	1.052	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4009-A1	0	1.348	1.348	01-RES	06-RES	06-RES	06-RES
4009-B2	0	0.224	0.224	01-RES	06-RES	01-RES	01-RES
4026	0	0.748	0.748	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	01-RES
4026	0.748	0.872	0.124	01-RES	06-RES	06-RES	06-RES
4026-A2	0	0.526	0.526	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	01-RES
4026-B1	0	1.214	1.214	01-RES	06-RES	06-RES	06-RES
4036	0	2.438	2.438	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4036-A1	0	0.224	0.224	06-RES	06-RES	06-RES	06-RES
4036-B1	0	0.218	0.218	06-RES	06-RES	06-RES	06-RES
4037-E1	0	0.07	0.07	01-RES	01-RES	01-RES	01-RES
4037-E1	0.07	0.338	0.268	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
4044	0.509	1.702	1.193	01-RES	06-RES	06-RES	06-RES
4044	0	0.509	0.509	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4044-B1	0	0.679	0.679	01-RES	06-RES	06-RES	06-RES
4044-E1	0	1.7	1.7	01-RES	06-RES	06-RES	06-RES
4045	0	0.701	0.701	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4045	0.701	2.189	1.488	01-RES	06-RES	06-RES	06-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
4045-A1	0	0.29	0.29	01-RES	06-RES	06-RES	06-RES
4045-B1	0	0.482	0.482	01-RES	06-RES	06-RES	06-RES
4045-C1	0	0.379	0.379	01-RES	06-RES	06-RES	06-RES
4045-D1	0	0.364	0.364	01-RES	06-RES	06-RES	06-RES
4045-D2	0	0.539	0.539	01-RES	06-RES	06-RES	06-RES
4046	0	0.443	0.443	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4100	0	2.401	2.401	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES	OPEN-HWY LEGAL
4100-B1	0	0.494	0.494	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES	OPEN-HWY LEGAL
4104	1.73	2.276	0.546	01-RES	06-RES	06-RES	06-RES
4104	0	1.73	1.73	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4104-A1	0	2.203	2.203	06-RES	MT 5/16-10/14	06-RES	MT 5/16-10/14
4104-A1	2.203	2.59	0.387	06-RES	06-RES	06-RES	06-RES
4104-A2	0	0.386	0.386	06-RES	MT 5/16-10/14	06-RES	MT 5/16-10/14
4104-A2	0.386	0.8	0.414	06-RES	06-RES	06-RES	06-RES
4104-B1	0	0.227	0.227	06-RES	06-RES	06-RES	06-RES
4164	0	0.455	0.455	06-RES	06-RES	06-RES	06-RES
4177	0	1.22	1.22	01-RES	01-RES	01-RES	01-RES
4180	0	0.467	0.467	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
4197	0	0.613	0.613	15-RES	03-RES	03-RES	03-RES
495	2.064	2.305	0.241	CO	CO	CO	CO
495	2.02	2.064	0.044	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495	0.935	2.02	1.085	CO	CO	CO	CO
495	0.903	0.935	0.032	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495	2.305	10.975	8.67	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495	0	0.575	0.575	CO	CO	CO	CO
495	0.575	0.607	0.032	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495	0.607	0.903	0.296	CO	CO	CO	CO
495-A1	0	0.742	0.742	06-RES	06-RES	06-RES	06-RES
495-A3	0	0.131	0.131	06-RES	MT 5/16-10/14	06-RES	MT 5/16-10/14
495-B1	0	0.52	0.52	06-RES	06-RES	06-RES	06-RES
495-C1	0	0.801	0.801	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-C1	0.801	0.934	0.133	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
495-C2	0	0.419	0.419	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-C3	0	0.329	0.329	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
495-C3	1.001	1.246	0.245	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-C3	0.622	1.001	0.379	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
495-C3	0.329	0.622	0.293	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-C4	0.225	0.415	0.19	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
495-C4	0	0.053	0.053	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
495-C4	0.053	0.225	0.172	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-C4	0.415	0.478	0.063	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-D1	0	2.126	2.126	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
495-F1	0	0.452	0.452	06-RES	06-RES	06-RES	06-RES
495-F2	0	0.483	0.483	06-RES	06-RES	06-RES	06-RES
495-F3	0	0.861	0.861	06-RES	06-RES	06-RES	06-RES
495-G1	0	0.34	0.34	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
501	0	1.812	1.812	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
525-A1	1.428	1.561	0.133	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
525-A1	1.335	1.428	0.093	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
525-A1	0	1.335	1.335	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
527	2.168	3.302	1.134	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527	3.431	5	1.569	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527	3.302	3.431	0.129	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527	2	2.168	0.168	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527	5	7.016	2.016	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527	1.883	2	0.117	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527	0	1.883	1.883	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527-A1	1.275	1.616	0.341	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
527-A1	0.493	1.275	0.782	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
527-A1	0	0.493	0.493	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
527-A2	0	0.372	0.372	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
527-A2	0.372	0.625	0.253	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
527-B1	0	1.514	1.514	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
527-C1	0	1.07	1.07	06-RES	06-RES	06-RES	06-RES
571	10.46	11.414	0.954	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	0	3.2	3.2	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	4	4.365	0.365	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	5.723	7	1.277	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	3.2	4	0.8	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	4.365	5.723	1.358	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	9.551	10.46	0.909	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571	7	9.551	2.551	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-001	0	0.453	0.453	UOPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-A1	0	0.595	0.595	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-A2	0	0.328	0.328	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-A3	0	0.232	0.232	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-A4	0	0.334	0.334	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-B1	0	0.426	0.426	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-C1	0	1.349	1.349	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-D1	0	0.279	0.279	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-E1	0	0.23	0.23	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
571-F1	0	0.262	0.262	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
578	1.64	2.065	0.425	01-RES	01-RES	01-RES	01-RES
622	4.725	6.783	2.058	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
622	4.67	4.725	0.055	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
622	0	4.67	4.67	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
622-A1	0	0.44	0.44	01-RES	06-RES	06-RES	06-RES
622-C1	0	0.618	0.618	01-RES	06-RES	06-RES	06-RES
622-C2	0	0.383	0.383	01-RES	06-RES	06-RES	06-RES
622-D1	0	0.732	0.732	01-RES	06-RES	06-RES	06-RES
622-E1	0	0.371	0.371	01-RES	06-RES	06-RES	06-RES
622-E2	0	0.115	0.115	01-RES	06-RES	06-RES	06-RES
622-E3	0	0.113	0.113	01-RES	06-RES	06-RES	06-RES
622-G1	0	0.417	0.417	01-RES	06-RES	06-RES	06-RES
695	0	6.809	6.809	CO	CO	CO	CO
695-012	0	0.05	0.05	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
695-015	0	0.102	0.102	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
708	6	7.772	1.772	CO	CO	CO	CO
708	7.772	14.023	6.251	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708	0	6	6	CO	CO	CO	CO
708-A1	0	0.309	0.309	01-RES	06-RES	06-RES	06-RES
708-A1	0.309	1.435	1.126	01-RES	06-RES	06-RES	01-RES
708-A2	0	0.383	0.383	01-RES	06-RES	06-RES	06-RES
708-A3	0	0.089	0.089	01-RES	06-RES	06-RES	06-RES
708-A4	0	0.133	0.133	01-RES	06-RES	06-RES	06-RES
708-A4	0.133	0.315	0.182	01-RES	01-RES	01-RES	01-RES
708-B1	0	0.612	0.612	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-B2	0	0.644	0.644	01-RES	06-RES	06-RES	06-RES
708-B3	0	1.025	1.025	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-B4	0	0.113	0.113	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-C1	0	1.25	1.25	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-C2	0	1.387	1.387	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES
708-C3	0	0.342	0.342	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
708-C4	0	0.14	0.14	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-C4	0.14	0.239	0.099	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	06-RES
708-C5	0	0.343	0.343	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-C6	0	0.443	0.443	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-D1	0.5	0.858	0.358	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-D1	0	0.5	0.5	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-D2	0	0.357	0.357	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-D3	0	0.042	0.042	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E1	0	1.475	1.475	OPEN-HWY LEGAL	06-RES	06-RES	06-RES
708-E1	1.475	2.859	1.384	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E2	0	0.44	0.44	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E3	0	1.101	1.101	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E4	0	0.278	0.278	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E5	0	0.287	0.287	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E6	0	0.267	0.267	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E7	0	0.219	0.219	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E8	0	0.326	0.326	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-E9	0	0.208	0.208	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-F1	0	0.588	0.588	01-RES	06-RES	06-RES	06-RES
708-G1	0	2.614	2.614	01-RES	06-RES	06-RES	06-RES
708-H1	0	0.273	0.273	01-RES	06-RES	06-RES	06-RES
708-H2	0	0.038	0.038	01-RES	06-RES	06-RES	06-RES
708-I1	0	1.178	1.178	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-J1	0	0.245	0.245	OPEN-HWY	OPEN-HWY	OPEN-HWY	OPEN-HWY

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
				LEGAL	LEGAL	LEGAL	LEGAL
708-J2	0	0.12	0.12	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
708-J3	0	0.325	0.325	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
709	0	4.25	4.25	CO	CO	CO	CO
774	0	0.323	0.323	CO	CO	CO	CO
774	0.323	2.224	1.901	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
774-A1	0	0.387	0.387	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
774-A1	1.387	2.412	1.025	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
774-A1	0.387	1.367	0.98	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
774-A1	1.367	1.387	0.02	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
774-B1	0	0.985	0.985	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
774-B2	0	0.057	0.057	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL	OPEN-HWY LEGAL
MTR-001	0	0.826	0.826	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-002	0	0.587	0.587	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-003	0	0.173	0.173	M-07	MT-01-RES	MT-01-RES	MT-01-RES
MTR-004	0	0.316	0.316	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-005	0	0.517	0.517	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-006	0	0.259	0.259	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-007	0	0.167	0.167	M-07	MT-01-RES	MT-01-RES	MT-01-RES
MTR-008	0	0.589	0.589	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-009	0	0.185	0.185	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-011	0	0.738	0.738	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-011	0.738	1.223	0.485	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
MTR-012	0	0.238	0.238	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-013	0	0.257	0.257	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-014	0	0.464	0.464	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-015	0	0.313	0.313	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-016	0	0.702	0.702	M-07	MT-01-RES	MT-01-RES	MT-01-RES
MTR-017	0	1.822	1.822	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-018	0	1.819	1.819	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-019	0	0.251	0.251	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-020	0	0.249	0.249	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-021	0	0.656	0.656	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-022	0	0.066	0.066	M-07	MT-01-RES	MT-01-RES	MT-01-RES
MTR-502	0	1.566	1.566	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-503	0	2.661	2.661	M-07	MT 5/16-10/14	MT-01-RES	MT-01-RES
MTR-504	0	0.981	0.981	M-07	MT-01-RES	MT-01-RES	MT-01-RES
MTR-505	0	0.362	0.362	M-07	MT-01-RES	MT-01-RES	MT-01-RES
PVT-201	0	0.469	0.469	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-202	0	0.416	0.416	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-203	0	0.577	0.577	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-204	0	0.058	0.058	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-205	0	0.064	0.064	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-206	0	0.253	0.253	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-207	0	0.356	0.356	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-208	0	0.501	0.501	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-209	0	0.531	0.531	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-210	0	0.474	0.474	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-211	0	0.053	0.053	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-212	0	0.708	0.708	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT

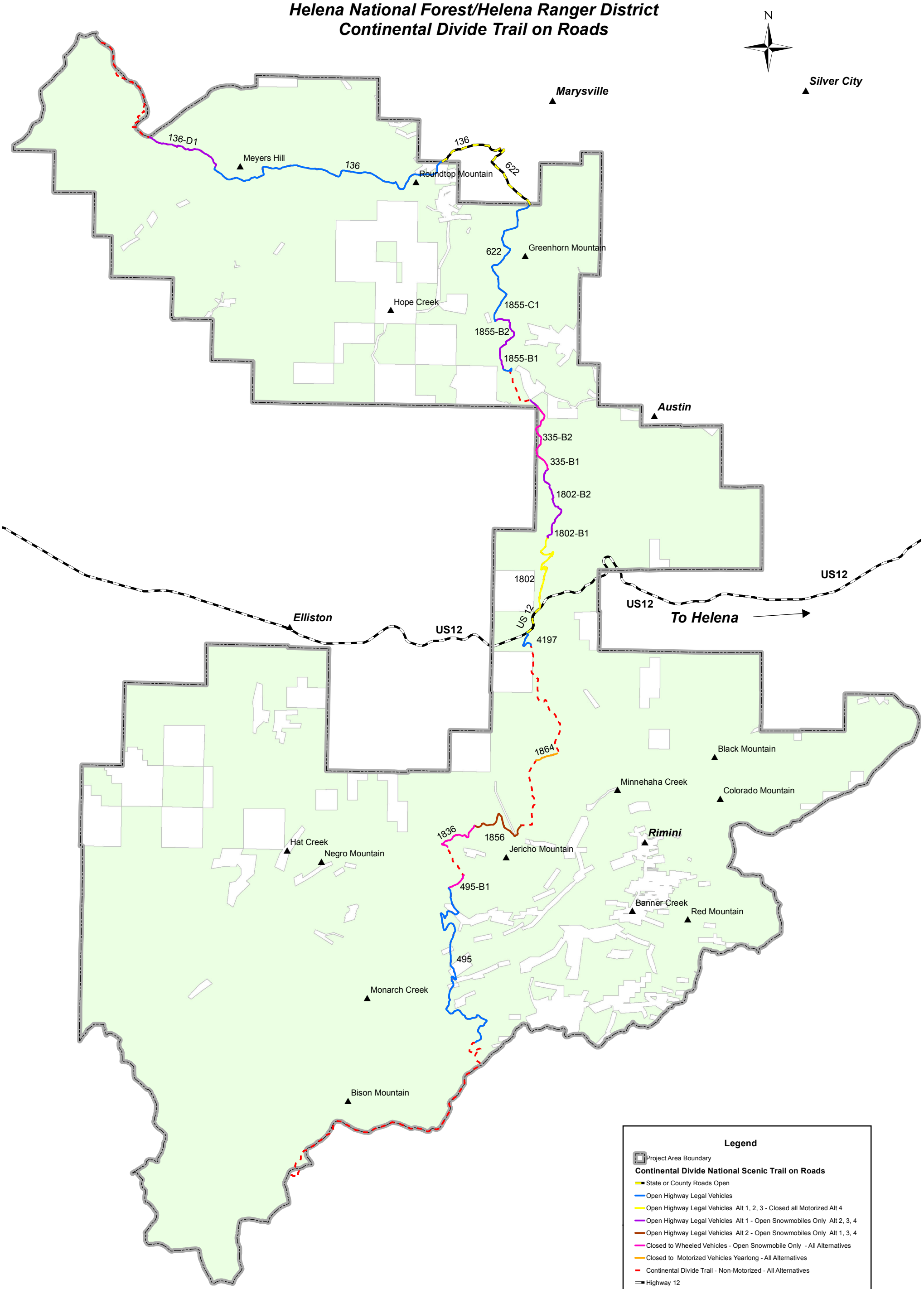
Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PVT-213	0	0.457	0.457	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-214	0	0.205	0.205	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-215	0	0.462	0.462	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-216	0	0.516	0.516	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-217	0	1.164	1.164	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-218	0	0.385	0.385	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-219	0	1.624	1.624	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-220	0	0.321	0.321	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-221	0	0.405	0.405	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-222	0	0.061	0.061	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-223	0	0.539	0.539	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-224	0	0.107	0.107	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-225	0	0.635	0.635	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-226	0	0.364	0.364	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-227	0	0.292	0.292	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-228	0	0.719	0.719	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-229	0	1.156	1.156	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-230	0	2.106	2.106	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-231	0	0.447	0.447	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-232	0	0.938	0.938	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-233	0	0.295	0.295	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-234	0	0.248	0.248	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-235	0	0.244	0.244	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-236	0	1.647	1.647	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-237	0	0.205	0.205	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-238	0	0.494	0.494	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-239	0	0.448	0.448	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-240	0	0.158	0.158	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-241	0	0.893	0.893	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-242	0	0.275	0.275	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-243	0	0.089	0.089	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-244	0	0.03	0.03	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-245	0	0.228	0.228	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-246	0	0.156	0.156	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-247	0	2.078	2.078	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-248	0	0.399	0.399	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-249	0	0.086	0.086	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-250	0	0.115	0.115	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-251	0	0.253	0.253	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-252	0	0.392	0.392	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PVT-253	0	0.251	0.251	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-254	0	0.197	0.197	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-255	0	0.337	0.337	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-256	0	0.797	0.797	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-257	0	0.424	0.424	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-258	0	0.298	0.298	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-259	0	3.545	3.545	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-260	0	0.888	0.888	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-261	0	0.041	0.041	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-262	0	0.65	0.65	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-263	0	0.381	0.381	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-264	0	0.202	0.202	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-265	0	0.316	0.316	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-266	0	0.187	0.187	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-267	0	0.42	0.42	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-268	0	0.135	0.135	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-269	0	0.163	0.163	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-270	0	0.136	0.136	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-271	0	0.454	0.454	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-272	0	1.226	1.226	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-273	0	0.622	0.622	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-274	0	0.593	0.593	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-275	0	1.14	1.14	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-276	0	0.416	0.416	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-277	0	0.556	0.556	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-278	0	0.423	0.423	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-279	0	0.106	0.106	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-280	0	0.592	0.592	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-281	0	0.1	0.1	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-282	0	1.107	1.107	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-283	0	0.206	0.206	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-284	0	0.222	0.222	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-285	0	0.39	0.39	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-286	0	0.357	0.357	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-287	0	0.271	0.271	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-288	0	0.313	0.313	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-289	0	0.533	0.533	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-290	0	0.279	0.279	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-291	0	0.347	0.347	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-292	0	0.216	0.216	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PVT-293	0	0.357	0.357	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-294	0	0.128	0.128	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-295	0	0.402	0.402	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-296	0	0.685	0.685	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-297	0	0.556	0.556	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-298	0	0.359	0.359	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-299	0	0.051	0.051	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-300	0	0.502	0.502	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-301	0	0.119	0.119	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-302	0	0.042	0.042	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-303	0	0.109	0.109	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-304	0	0.289	0.289	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-305	0	0.114	0.114	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-306	0	0.078	0.078	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-307	0	0.753	0.753	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-308	0	0.831	0.831	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-309	0	0.511	0.511	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-310	0	0.328	0.328	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-311	0	1.003	1.003	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-312	0	0.925	0.925	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-313	0	2.077	2.077	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-314	0	0.59	0.59	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-315	0	1.239	1.239	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-316	0	0.308	0.308	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-317	0	0.122	0.122	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-318	0	0.294	0.294	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-319	0	0.382	0.382	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-320	0	0.273	0.273	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-321	0	0.302	0.302	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-322	0	1.238	1.238	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-323	0	1.052	1.052	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-324	0	0.644	0.644	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-325	0	0.252	0.252	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-326	0	0.167	0.167	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-327	0	0.154	0.154	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-328	0	0.098	0.098	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-329	0	0.735	0.735	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-330	0	0.965	0.965	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-331	0	0.154	0.154	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-332	0	0.206	0.206	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT

Route ID	Beginning Mile Post	Ending Mile Post	Length (miles)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PVT-333	0	0.34	0.34	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-334	0	0.516	0.516	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-335	0	1.267	1.267	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-336	0	0.227	0.227	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-337	0	0.909	0.909	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-338	0	0.215	0.215	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-339	0	0.503	0.503	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-340	0	0.101	0.101	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-341	0	0.121	0.121	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-342	0	0.194	0.194	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-343	0	0.687	0.687	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-344	0	0.229	0.229	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-345	0	0.521	0.521	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-346	0	0.333	0.333	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-347	0	0.326	0.326	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-348	0	0.385	0.385	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-349	0	0.891	0.891	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-350	0	0.485	0.485	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-351	0	0.233	0.233	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-352	0	0.169	0.169	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-353	0	1.031	1.031	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-354	0	0.257	0.257	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-355	0	0.153	0.153	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-356	0	0.075	0.075	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
PVT-364	0	0.255	0.255	OPEN-PVT	OPEN-PVT	OPEN-PVT	OPEN-PVT
U-200	0	1.163	1.163	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
U-201	0	0.346	0.346	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
U-202	0	0.596	0.596	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
U-203	0	0.938	0.938	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
U-204	0	0.497	0.497	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES
U-205	0	0.992	0.992	UOPEN-HWY LEGAL	NS-01-RES	NS-01-RES	NS-01-RES

Divide Travel Plan
Helena National Forest/Helena Ranger District
Continental Divide Trail on Roads



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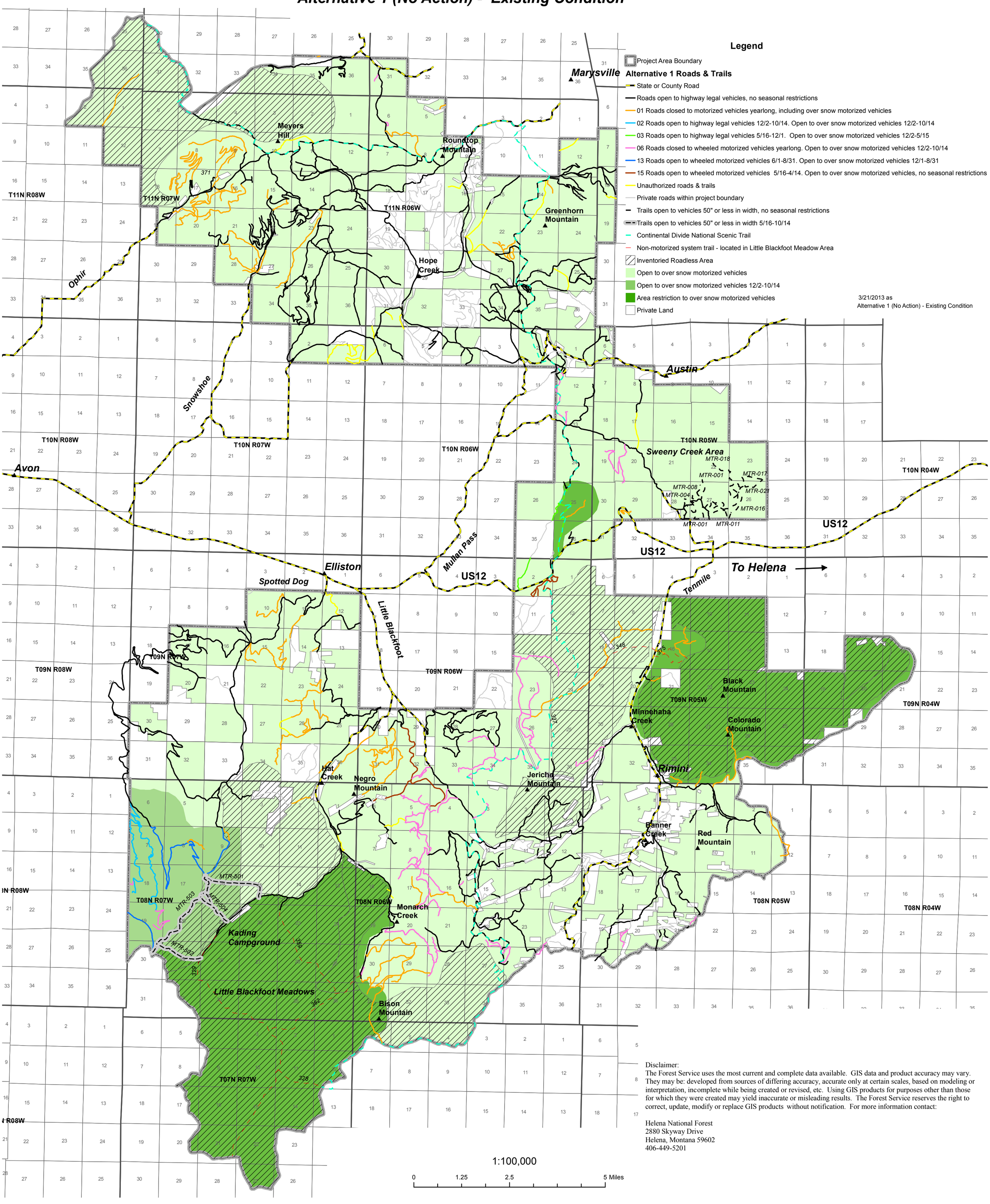
406-449-5201

1:135,000

0 0.75 1.5 3 Miles

2/24/2014 as

Helena National Forest
Helena Ranger District
Divide Travel Plan
Alternative 1 (No Action) - Existing Condition



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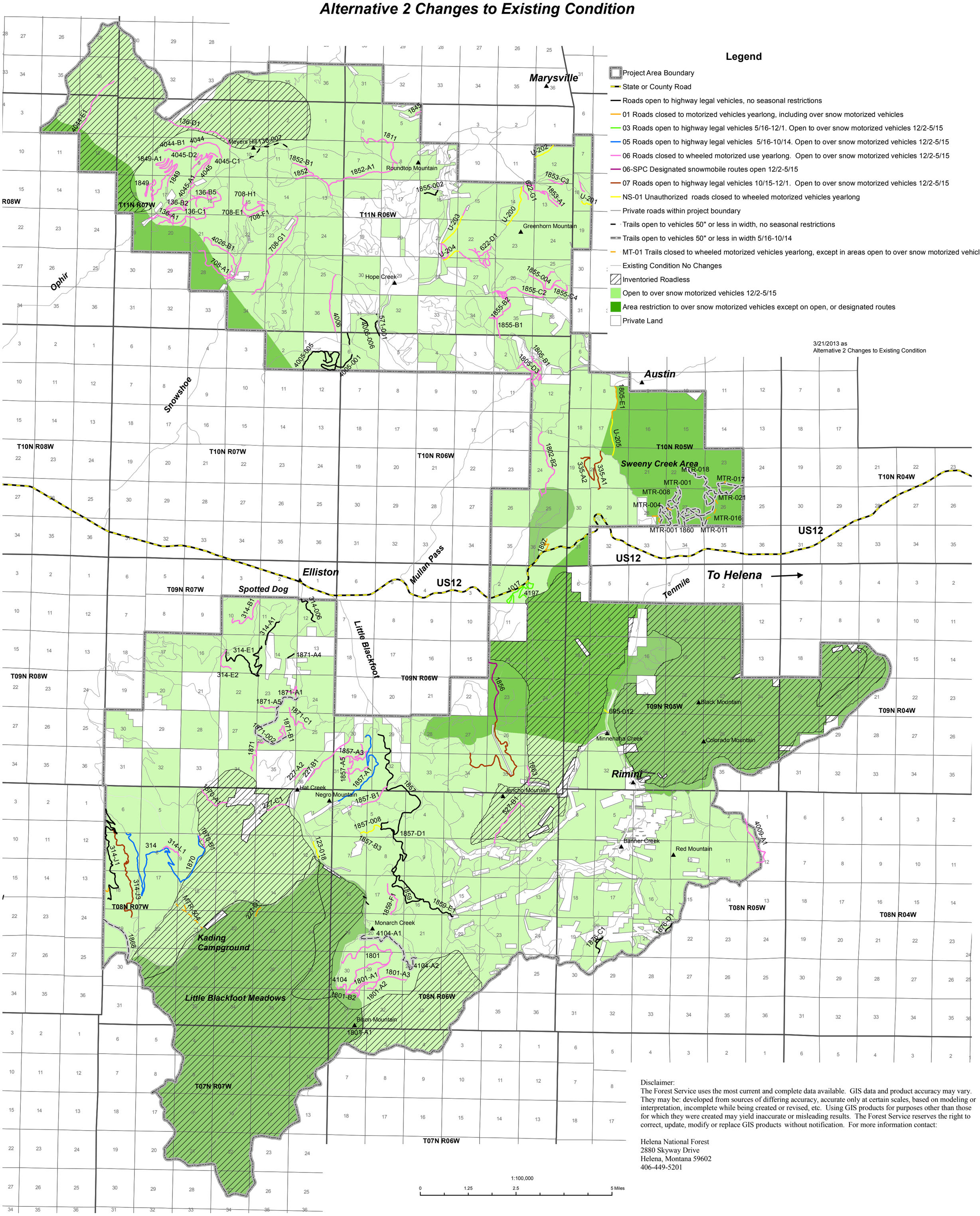
Helena National Forest
Helena Ranger District
Divide Travel Plan
Alternative 2 Changes to Existing Condition



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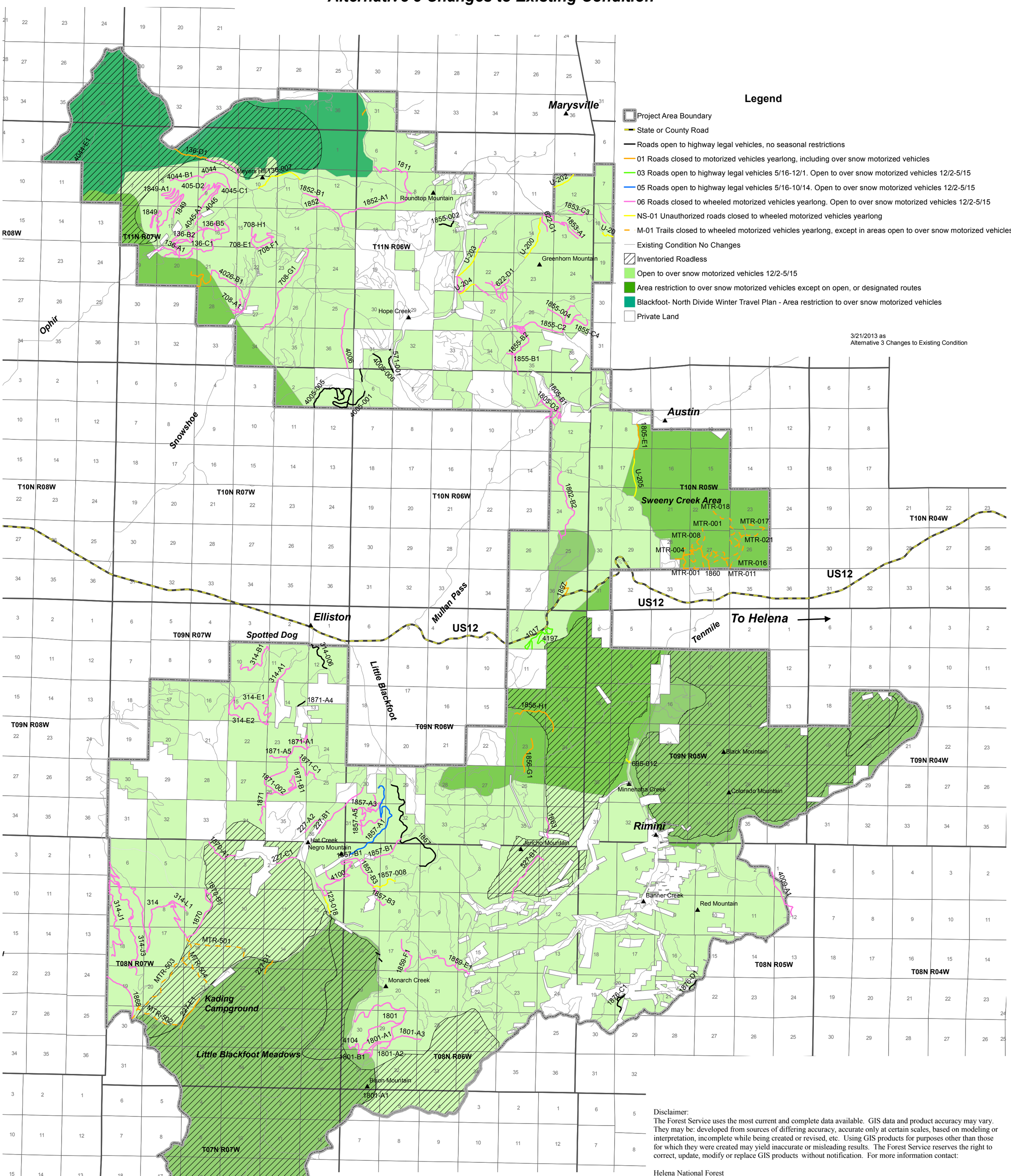
Helena National Forest
Helena Ranger District
Divide Travel Plan
Alternative 3 Changes to Existing Condition



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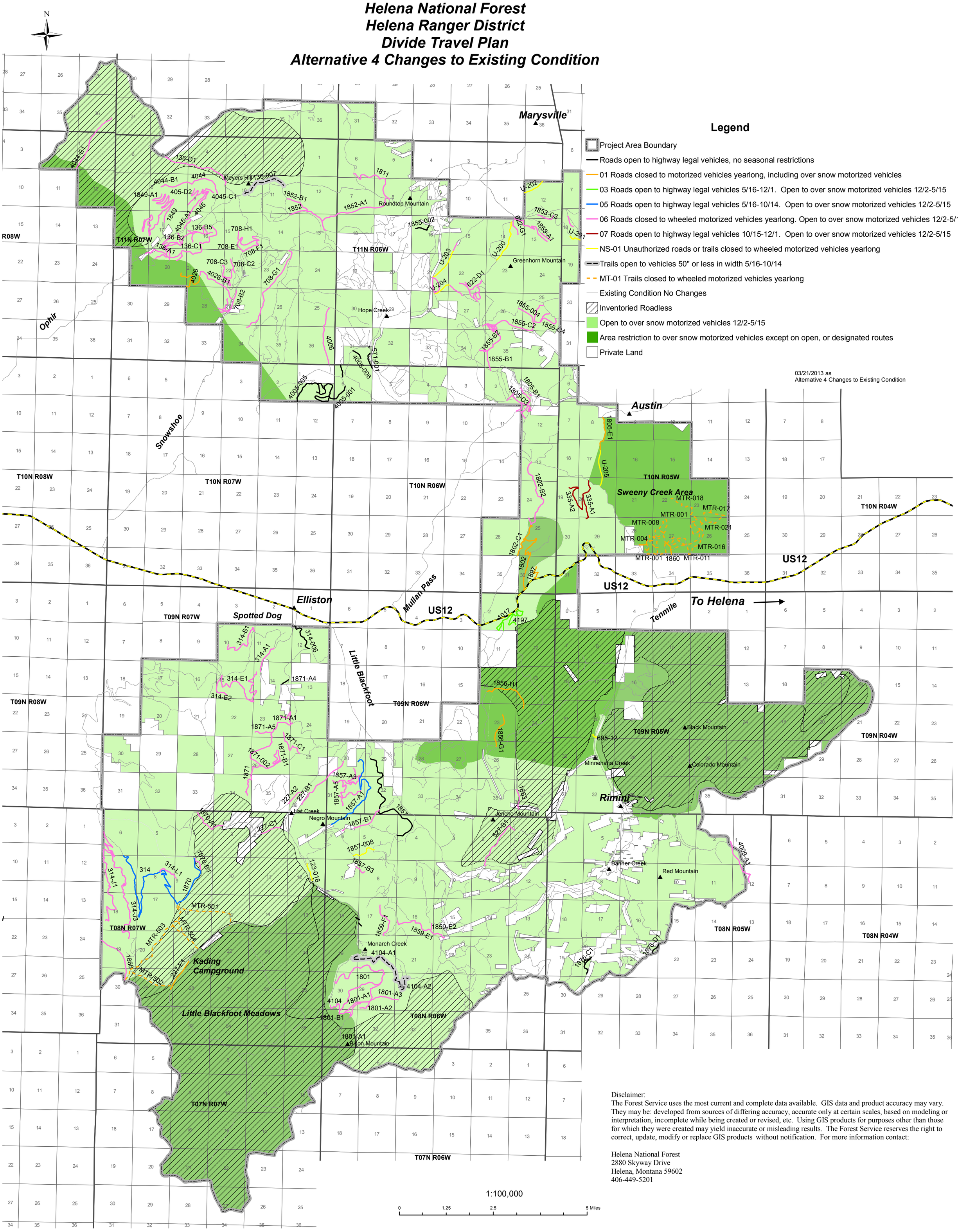
Helena National Forest
Helena Ranger District
Divide Travel Plan
Alternative 4 Changes to Existing Condition



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