United States
Department of
Agriculture

Forest
Service

Updated
February 2011

Updated Environmental Assessment

Designation of Summer Motorized Travel on the Madison Ranger District

Madison Ranger District, Beaverhead-Deerlodge National Forest
Madison and Beaverhead Counties, Montana

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Introduction

The purpose of this project is to update designated summer motorized travel on the Madison Ranger District by proposing some changes to which roads and trails are open to specific motorized vehicle types (VT). The District is also proposing to adjust the Season of Use (SOU) for motorized travel on some roads and trails, and to establish a no wake designation for motorized watercraft on Elk Lake. These changes are proposed as part of an overall effort to comply with the 2005 Travel Management Rule (2005 TMR) and the 2009 Forest Plan. The analysis is being conducted in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal, State, and local law, regulation and policy.

Location

The Madison Ranger District is one of seven Ranger Districts on the Beaverhead-Deerlodge National Forest (BDNF) located in southwestern Montana. The Madison Ranger District is the eastern most of the seven Ranger Districts. The majority of the Ranger District is located in Madison County with a small area in the south in Beaverhead County.

The Madison Ranger District covers approximately 706,900 acres. The district includes the southern portion of the Tobacco Root Mountains, the west slope of the Madison Range, and most of the Snowcrest, Greenhorn, and Gravelly mountain ranges (see Appendix A, General Project Area Map). There are no park lands or prime farmlands identified within the Madison District boundaries.

As identified in the 2009 Forest Plan, the project area is covered by all or portions of three Landscape Areas, twenty-seven Management Areas, six Fish Key and two Restoration Key watersheds, and nine Hunting Units (see Appendix A for maps).

Background

Since the late 1980's, motorized recreation on the Forest has increased. Looking into the future over the next 10 to 15 years, motorized recreation is expected to continue growing between 10 to 15 percent across the Forest (2009 CFEIS Ch 2, pg. 16). The Madison Ranger District is expecting similar increases in motorized recreation.

Brief History of Recreation and Travel Maps on the Madison Ranger District

On June 1, 1987, the Forest published an Interagency Visitor Map for Southwest Montana to help minimize resource impacts and user conflicts. This map identified roads, trails, and areas where specific types of motorized vehicles could not be used during specific times of the year and where cross-country travel was not allowed. The listing of Special Conditions, Operating Conditions, and Designations and Restriction information on the map identified these routes and areas. The majority of the restrictions on the Madison District focused on closures for erosion control, elk security/calving, and user conflicts. The map identified that direct access to temporary (dispersed) campsites within 300 feet of designated routes was allowed and that there would be no exception to the travel restrictions for game retrieval. It did not speak to fuel wood gathering, parking, or other motorized recreational activities.

The use of All Terrain Vehicles (ATV) increased forest wide between 1987 and 1990. To help minimize impacts from this increase and as part of the three-year update to the Interagency Visitor Map for Southwest Montana, the June 1990 update added specific direction for the Madison District. Under Special Conditions two Temporary Exceptions, one for access to

temporary (dispersed) campsites and one for routes closed due to natural causes (snowdrifts, mud, slumps, etc.) were added. Except for the Gravelly and Snowcrest mountain ranges, direct access to temporary (dispersed) campsites within 300 feet of designated routes was allowed for the purpose of camping, parking, fuel wood gathering and other recreational purposes unless otherwise posted as closed. In the Gravelly and Snowcrest mountain ranges motorized access to temporary (dispersed) campsites was allowed only where posted as open. Game retrieval, Operating Conditions, and reasons for route closures identified on the 1987 map were carried over to the 1990 map. Designations and Restrictions were changed at this time to include ATV and area restrictions for Wilderness Study Area protection. One additional restriction for an area (22) was added to minimize erosion during specific times of the year instead of yearlong. Under "Terms Used," definitions for ATV, off highway vehicles (OHV), bicycles, and trail bikes were added.

In 1993, the Forest updated the Interagency Visitor Map for Southwest Montana (see project record for map). Under Special Conditions, the only change was the addition of Access for Hunters with Disabilities. There were no changes to the Operating Conditions or the Terms Used. Under the Travel Guide Legend, the Madison District added two areas open to off route travel. The district also added an area restriction (5) which changed the season of use for this area in the Tobacco Root Landscape.

In 1996, the Forest again updated the Interagency Visitor Map for Southwest Montana. The name was changed to "Interagency Visitor/Travel Map Southwest Montana" (see project record for map). The East Half map covered the Madison District. There were no changes to the Operating Conditions. The "Terms Used," added a definition for Road Vehicle. Under Special Conditions, Wilderness and Weed Seed Free Forage were added. Although there was a new Designation and Restriction area added (34) for the Forest, the Madison District did not use this designation. This map continued to identify areas open to off route travel as well as routes where no travel off route during the closed periods was allowed.

The next update of the 1996 Interagency Visitor/Travel Map Southwest Montana was in 2001 when an insert/sticker disclosing the 2001 Tri-State Off-Highway Vehicle (OHV) Plan Amendment for Forest and Grassland Plans in Montana, North Dakota, and South Dakota was added. This decision was known as the Tri-State OHV Decision, which limited motorized wheeled travel to existing motorized routes on National Forest and Bureau of Land Management (BLM) lands in the three states. This decision established the legality of motorized travel based on a visual interpretation by the user rather than a map of roads and trails where motorized uses were allowed. Monitoring and public comments since the 2001 Tri-State Decision showed that the "user interpretation" approach to identifying these routes was confusing and ineffective.

There were no other updates to the Interagency Visitor/Travel Map Southwest Montana after the 2001 insert/sticker until 2008 (see project record for map). Between 2001 and 2008 there were changes in direction from the Washington Office (direction to use FS-643 for road analysis procedures), changes in the electronic data bases and tools (INFRA data structure and GIS tools), map publishing schedule changes, the 2005 Travel Management Rule (TMR), and the revision of the Beaverhead-Deerlodge National Forest Plan was in progress.

In 2008, the Interagency Visitor/Travel Map Southwest Montana was replaced by a set of three maps titled, "Beaverhead-Deerlodge National Forest North, Central, and South Travel Plan Map" (2008 BDTPM). The Central and South maps cover the Madison District. The content remained the same with respect to access to temporary (dispersed) campsites, disabled hunters, and game retrieval. It did prohibit use of wheeled motorized vehicles off existing routes for firewood gathering and prohibited parking in a manner that would block traffic. The last update to the 2008

BDTPM was in September of 2009, when the forest printed errata to the maps, to correct some minor printing errors.

Travel Management Rule

In November 2005, the Washington Office issued the Final Travel Management Rule (TMR) for the designation of routes and areas for motorized vehicle use (36 CFR 212, 251, 261). The TMR requires the Forest to designate a system of roads, trails (routes) and areas for motor vehicle use by vehicle class and, if appropriate by time of year (36 CFR 212.55). Once designated, a Motor Vehicle Use Map (MVUM) is developed depicting those routes and areas open to motorized use by Vehicle Type (VT) and where appropriate, the Season of Use (SOU). Based on the TMR, in order for a route or area to be considered designated, it must be "A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to § 212.51 on a motor vehicle use map". Under section 212.50(b) of the TMR, previous administrative decisions regarding travel management made under other authorities, including designations and prohibitions made in Forest Plans, may be included, but are not required to be reconsidered, as part of the designation of routes and/or areas for the MVUM.

The previous (1987 to 2008) forest wide travel maps identified where motorized travel *was restricted*. This analysis will disclose where, when, and with what types of vehicles, motorized travel *is allowed* (TMR Subpart B, 212.50).

2009 Revised Forest Plan

In 2009 the Beaverhead-Deerlodge National Forest completed the revision of the Forest Plan. The Record of Decision (ROD) for the 2009 Forest Plan included the designation of allocations including Research Natural Areas, Recommended Wilderness and Summer Recreation Allocations. The Madison District is covered by a number of these allocations which restrict allowable uses within them (See Appendix A for map). The 2009 Forest Plan also created new Forest Wide and Management Area goals, objectives and standards.

The 2009 Forest Plan restricts year-round wheeled motorized travel to designated routes or areas. Additionally, the plan adopted the Interim Road and Trail Inventory map (2009 Forest Plan, Ch. 3, Errata pg. 53) and, where routes have not been designated through site-specific travel planning, restricts motorized vehicles to open motorized routes identified on the Forest Plan Interim Roads and Trails Inventory GIS layer as identified on page 53 of the 2009 Forest Plan. Additionally, motorized wheeled travel on routes leading to identified dispersed campsites is allowed. Exceptions to these restrictions are also authorized by the Forest Plan as listed in Recreation Standard #3 on page 32 of the 2009 Forest Plan.

On February 12, 2010 Forest Supervisor Dave Myers issued a second Record of Decision (ROD 2) based on the analysis in the 2009 Corrected Final Environmental Impact Statement (2009 CFEIS). ROD 2 closed routes in Forest Plan non-motorized allocations to conform on-the-ground management to Forest Plan Direction. ROD 2 was developed and issued as the analysis for this project was proceeding. Because of the uncertainty in timing of the issuance of the ROD 2, the effects of the ROD 2 are fully analyzed and disclosed under the cumulative effects sections of each resource effects analysis in this Updated EA.

Purpose and Need for Action

The purpose of this project is to update designated summer motorized travel on the Madison Ranger District in order to:

- Comply with the 2009 Revised Beaverhead-Deerlodge Land and Resource Management Plan (2009 Forest Plan) Forestwide and Management Area goals, objectives, and standards (Ch. 3 and 4).
- *Comply with* the November 2005 Travel Management Rule (2005 TMR) and the production of a Motor Vehicle Use Map (MVUM) for the Madison Ranger District.
- Better protect natural resources.
- Improve recreation management related to motor vehicle use.
- Decrease user conflicts.

This decision will not:

- Reconsider all past travel management decisions on the Madison District.
- Construct any new or re-construct any existing roads or trails.
- Designate motorized areas.
- Make new or change existing decisions on *non-wheeled* winter motorized travel management.
- Make new or change existing decisions on where specific types of non-motorized recreation can occur *(e.g. bicycles versus stock animals)*.
- Make decisions about motorized use on other federal, state, or private lands within the Madison District boundary.
- Change decisions made as part of the 2009 Forest Plan.
- Analyze or make a determination about how route closures and decommissioning will be implemented on the ground.
- Change existing decisions regarding motorized travel for permitted activities (firewood gathering, disabled hunting, private landowner access, allotment management, etc.), game retrieval, or parking.

NOTE: The Purpose and Need above was clarified slightly in this Updated EA. Clarifying phrases appear above in italics. These clarifications have not changed the plain meaning of the original Purpose and Need, but rather have provided the necessary detail so as to minimize confusion expressed during public and internal comment.

Decision Framework

Given the purpose and need, the deciding official will review the proposed action and alternatives to the proposed action, the effects analysis in this Updated EA, project record, and all public comments to make the following decision(s):

- Whether the effects on the quality of the human environment, based on the context and intensity of the impacts, are significant.
- Whether the Proposed Action meets the Purpose and Need.
- Whether one of the other alternatives or combination of the alternatives meets the purpose and need better then the Proposed Action.

Public Involvement

The proposal was listed in the Schedule of Proposed Actions (SOPA) in July 2007 and has been listed every quarter since. The initial proposals were presented at an "open house" held in Sheridan, Montana on July 9, 2007. A news release providing similar information was provided to area media contacts on August 21, 2007.

Seventeen people from Alder, Sheridan, Ennis, Twin Bridges, and Virginia City, Montana attended the open house. Forest Service representatives presented the draft proposal using maps and answered questions. Handouts were available and some individuals provided written comments. Attendees who provided a mailing address were included on the initial scoping mailing list.

A written proposal was provided to the public and other agencies for comment starting August 8th, 2007 for 30 days. The proposal was mailed to 732 individuals and organizations who had previously expressed an interest in travel management projects on the Madison Ranger District.

The scoping process generated responses from 140 individuals and organizations. The full content of all letters received during this time period are available in the project file.

In April 2008, a postcard was mailed to individuals and organizations previously expressing interest in this project. The post card provided recipients an opportunity to identify their preferred format for commenting on the Environmental Assessment (EA).

During the summer of 2008, the District received petitions signed by 67 people opposing the "No Wake" speed on Elk Lake.

Between April 2008 and January of 2009, the Forest completed the revision of the Beaverhead-Deerlodge Land and Resource Management Plan (2009 Forest Plan). As part of this process the public was involved in identifying some route specific concerns and issues. As identified on page 10 of the 2009 Corrected Environmental Impact Statement (2009 CEIS), there were numerous opportunities, over 50 public meetings, for sharing comments and concerns, which included petitions opposed to motorized closures. These and other comments resulted in the Corrected Interim Road and Trail Inventory map. This map was the starting point for the Madison Ranger District summer motorized designations.

The EA was mailed out to 118 individuals, groups, and Tribal Governments for a 30 day comment period in January 2010. A Legal Notice was published in the Montana Standard, the newspaper of record, on January 10th, 2010. During the 30 day comment period, the Madison District held 3 open houses (January 21 in Ennis, January 22 in Sheridan, and January 30 in Ennis). During the open houses the District provided Public Comment Forms for people to provide comments. We received three hand written forms at the meetings. The comments provided route specific concerns as well as information on routes the commenters felt needed attention.

During the three open houses, a total of sixteen signatures were collected on the sign in sheets. During the 30 day comment period we received comments from 37 individuals and groups. The IDT came together to review the comments and to provide responses. (See project record for responses). The 30 day comments were used to refine the project and provided the deciding official with information to consider in issuing a decision.

Issues

Based on comments received during scoping, four issues were identified;

- Changing Elk Lake from a recreation lake that allows motorized watercraft at speeds that produce wakes to a recreation lake that prohibits motorized watercraft at speeds that produce wakes.
- Confining all motorized use to the existing Forest system roads and trails and providing more opportunity for non-motorized recreation.
- Providing a wider variety of motorized recreational opportunities.
- Loss of security for wildlife by allowing increased motorized recreation.

The owners of Elk Lake Resort and several of their patrons, through signed petitions, identified the first issue. The owners feel a no wake speed on Elk Lake would decrease their business and their patrons feel it will decrease the recreational opportunities for motorized watercraft.

Several individuals and groups identified the second issue. They believe all motorized recreation use should be limited to the existing Forest system roads and trails.

A number of commenters identified specific suggested changes to the motorized transportation system on the Madison Ranger District to provide a wider variety of motorized recreation opportunities. These comments were summarized and captured in the third issue above.

Loss of wildlife secure habitat was also identified by a number of commenters as an issue.

The following section describes how these issues and other specific scoping comments were used to create the proposed action and alternatives.

Alternative Development

The IDT addressed the issues identified in scoping comments by creating simple metrics by which changes to the issues could be measured:

- Change in watercraft speed on Elk Lake
- Change in non-motorized recreation opportunities
- Change in motorized recreation opportunities
- Change in wildlife secure habitat

These metrics are used in the corresponding resource effects sections of this document to highlight changes to the issues by alternative; the first three of which are analyzed under recreation effects and the final one analyzed under wildlife effects.

The IDT crafted the Proposed Action and alternatives to respond to: the issues and specific suggestions made during scoping; site-specific knowledge of the resources within the IDT; the Purpose and Need for the project.

Alternative A – No Action

Alternative A was developed to provide a baseline by which to compare the proposed action and alternatives as required by NEPA and its implementing regulations. Alternative A represents the current network of routes open to motorized use.

Alternative B – Proposed Action

Alternative B, the proposed action, provides a slight decrease in total open motorized route miles, while increasing the variety of motorized recreation opportunities by converting some roads to trails. Specific changes to route Vehicle Type (VT) and Season of Use (SOU) were also proposed in this alternative to address site-specific natural resource concerns and recreation management opportunities identified by the IDT and the public in scoping comments. Wildlife secure habit was considered in the development of this alternative. The IDT also considered changes in motorized activity that has occurred or is proposed on surrounding Forests, other Federal agency lands (Bureau of Land Management (BLM)), and State lands (Wildlife Management Areas) when developing the alternatives. Specifically, in the development of route Season of Use (SOU), the IDT coordinated with the Dillon BLM Field Office, Montana Department of Fish, Wildlife, and Parks, and the U.S. Fish and Wildlife Service to maximize consistency in management of routes that cross jurisdictional boundaries.

Alternative B Modified – Proposed Action Modified

Alternative B Modified represents a refinement of the proposed action to address comments received during the 30-day comment period, to provide consistency with the 2009 Forest Plan, and to address minor data errors identified by the IDT and in comments. Specifically, Alternative B, the Proposed Action, was modified in the following ways: modifications to site-specific VT and SOU on specific routes for consistency with adjacent lands; limited modifications of route segments open to motorized use; adjustments to previously proposed conversions of roads to trails to comply with Management Area Standards in the 2009 Forest Plan; creation of a new SOU code and application of that code to routes where snowmobile trail grooming is authorized but conflicts with wheeled motorized use; clarifications on allowances for motorized access to dispersed camping; and minor data error corrections resulting from inconsistencies between the INFRA database, GIS coverage's, and the Forest Travel Map. See Appendix C for specific route-by-route changes and rationales.

Alternative C

Alternative C was developed to respond to those who feel all motorized recreation use should be confined to the existing Forest system roads and trails, those who desire more non-motorized recreation, and those opposed to motorized watercraft travel speed restrictions (no-wake designation) on Elk Lake. Wildlife secure habit was also considered in the development of this alternative as well.

Alternatives Considered but Eliminated from Detailed Consideration

Maximum motorized alternative- This action was considered, analyzed, and decided in the 2009 Corrected Final Environmental Impact Statement and Record of Decision for the Revised Beaverhead –Deerlodge Forest Plan (CFEIS revision topic #4 in Ch. 1, pg. 3, Ch. 5, pg. 612, and 628-639). The extensive public involvement and analysis during plan revision adequately covered this alternative and there was no need for further analysis or consideration here.

Maximum non-motorized alternative - This action was considered, analyzed, and decided in the 2009 Corrected Final Environmental Impact Statement and Record of Decision for the Revised Beaverhead –Deerlodge Forest Plan (CFEIS revision topic #4 in Ch. 1, pg. 3, Ch. 5, pg. 615, and 631-632). The extensive public involvement and analysis during plan revision

adequately covered this alternative and there was no need for further analysis or consideration here.

Elk Lake July to August motorized watercraft wake speeds – The suggestion was made that boats be allowed to produce a wake in July and August, and no wake during the rest of the boating season. The majority of Elk Lake is in the Summer Backcountry allocation (from the Narrows north) and thus considering this alternative in detail was not warranted as it would not be consistent with the 2009 Forest Plan Standards for Recreation (Page 31-33), specifically Standard #9 to manage for a semi-primitive motorized recreation experience in Summer Backcountry Allocations from May 16 thru December 1. This alternative's consistency with the 2009 Forest Plan direction was effectively considered in the recreation effects analysis for Alternatives A and C as these alternatives propose that watercraft be allowed to travel at speeds which create a wake year-round. Limiting Season of Use to the suggested timeframes would not alleviate the lack of Forest Plan consistency for this suggested alternative.

North and South motorized split on Elk Lake - The suggestion was made to allow motorized watercraft to travel at speeds that produce a wake at the northern end of Elk Lake and to prohibit motorized watercraft from travelling at speeds that produce a wake at the southern end of Elk Lake to alleviate user conflicts. The majority of Elk Lake is in the Summer Backcountry allocation (from the Narrows north) and thus considering this alternative in detail was not warranted as it would not be consistent with the 2009 Forest Plan Standards for Recreation (Page 31-33), specifically Standard #9 to manage for a semi-primitive motorized recreation experience in Summer Backcountry Allocations from May 16 thru December 1. This alternative's consistency with Forest Plan direction was effectively considered in the recreation effects analysis for Alternatives A and C as these alternatives propose that watercraft be allowed to travel at speeds which create a wake speed on both the North and South halves of the lake. Allowing motorized watercraft to travel at speeds that produce a wake on only the North end of Elk Lake would not alleviate the lack of Forest Plan consistency for this suggested alternative.

Alternative A (No Action)

This alternative represents the existing motorized routes (roads and trails), areas, Vehicle Types (VT), and Seasons of Use (SOU) on the Madison Ranger District (see Appendix B for detailed maps. NOTE: Due to the scale of the map, the area designations and applicable restrictions are not shown but can be seen on the 2008 BDTPM).

The 2009 Forest Plan Interim Roads and Trails Inventory GIS Layer displayed on page 53 of the 2009 Forest Plan (Forest Plan Interim Inventory) was developed through the Forest Planning process and serves as the interim route (road and trail) inventory for the Forest and Madison Ranger District. Motorized vehicles are restricted to routes displayed in the Forest Plan Interim Inventory. The existing motorized restrictions for routes included in the Interim Inventory including Vehicle Type (VT) and Season of Use (SOU) is determined using the 2008 Beaverhead-Deerlodge National Forest North, Central, and South Travel Plan Maps (2008 BDTPM). See Table 7, in the Map Packet, for specific route VT/SOU. Of note is that these maps identify *when routes are closed*. By contrast, and consistent with the TMR (Subpart B, 212.50), all action alternatives in this document identify miles by VT/SOU for *when routes are open*.

There are approximately 1,509.5 miles of travel routes on the Madison District. Table 1 below provides a summary of the mileage breakdown.

Table 1. Summary of existing routes and status

Route Type	System Status	Motorized Status	Miles
Road	System	Closed	100.4
Road	System	Open	549.4
Road	Unauthorized	Closed	210.1
Road	Unauthorized	Open	12.0
Trail	System	Closed	392.6
Trail	System	Open	174.3
Trail	Unauthorized	Closed	67.3
Trail	Unauthorized	Open	3.3
Total			1,509.5

If selected, in addition to the mileages described in table 1 above this alternative would:

- Continue access to dispersed camping sites consistent with interim allowance described under Recreation Standard #3 (2009 Forest Plan pg. 32): “Motorized wheeled travel on routes leading to identified dispersed campsites is allowed.”
- Continue to allow motorized watercraft to travel at speeds that create a wake on Elk Lake.
- Maintain a Forest Service field presence for enforcement and education.

Alternative B (Proposed Action)

Table 2 below is a summary of the proposed changes as compared to the No Action alternative. See Appendix C for detailed information on proposed changes and route-by-route rationale for the change. See Appendix B, the map packet, for detailed maps and VT/SOU map code key.

Table 2. Alternative B, Summary of Change from Alternative A

Alternative B Change Summary	Miles
Add dispersed site access as system motorized trails.	6.7
Add un-authorized roads as system motorized roads.	1.8
Add un-authorized trails as system motorized trails.	3.6
Close un-authorized roads to motorized use.	3.3
Close existing system roads to motorized use.	18.7
Close existing system trails to motorized use.	9.9
Remove existing system roads from the system (decommission).	4.2
Convert existing system motorized roads to system motorized trails.	93.6
Convert maintenance level 2 or 3 roads to maintenance level 1 roads.	18.2
Change VT/SOU on existing motorized routes.	47.3
No change from the existing condition.	615.4

If selected, in addition to the actions described in table 2 above, this alternative would:

- Implement a no-wake travel speed on Elk Lake for motorized watercraft. This would be implemented two years from the signing of this decision.
- Replace all Area delineations and the Route and Area Restrictions identified on the 2008 Beaverhead-Deerlodge Travel Plan Map (2008 BDTPM) and September 2009 Errata with route specific designations as displayed in the VT/SOU Map Code Key in Appendix B. This applies to the Madison Ranger District only.
- In the Gravelly Landscape, designate routes that provide access to identified dispersed campsites as system motorized trails. These trails would be open to all types of vehicles.
- In the Tobacco Root Landscape, motorized wheeled travel on existing routes leading to identified dispersed campsites is allowed for the purpose of dispersed camping within 300 feet of designated routes open to motorized use.
- Post heritage resource protection signs at sites shown to have problems with vandalism.
- Maintain a Forest Service field presence for enforcement and education.
- If monitoring determines that trumpeter swans have returned to nesting territories on Elk Lake, implement an area closure to boating and fishing on the north end of Elk Lake within 1500 feet of the nest site between April 1 and July 15. Implement public education with signing and/or brochures.

Alternative B Modified

Table 3 below is a summary of the proposed changes as compared to the No Action Alternative. See Appendix C for detailed information on proposed changes, route-by-route rationale for the change, and VT/SOU for each route changed.

Table 3. Alternative B Modified, Summary of Changes from Alternative A

Alternative B Modified Change Summary	Miles
Add dispersed site access as system motorized trails.	6.6
Add un-authorized roads as system motorized roads.	1.9
Add un-authorized trails as system motorized trails.	3.6
Close un-authorized roads to motorized use.	3.4
Close existing system roads to motorized use.	22.0
Close existing system trails to motorized use.	9.9
Remove existing system roads from the system (decommission).	4.2
Convert existing system motorized roads to system motorized trails.	77.8
Convert maintenance level 2 or 3 roads to maintenance level 1 roads.	21.9
Change VT/SOU on existing motorized routes.	116.8
No change from the existing condition.	558.3

If selected, in addition the actions described in table 3 above, this alternative would:

- Implement a no-wake travel speed on Elk Lake for motorized watercraft. This would be implemented two years from the signing of this decision.
- Replace all Area delineations and the Route and Area Restrictions identified on the 2008 Beaverhead-Deerlodge Travel Plan Map (2008 BDTPM) and September 2009 Errata with route specific designations as displayed in the Updated VT/SOU Map Code Key in Appendix D. This applies to the Madison Ranger District only.
- In the Gravelly Landscape, designate routes that provide access to identified dispersed campsites as system motorized trails. These trails would be open to all types of vehicles.
- In the Tobacco Root Landscape, motorized wheeled travel on existing routes leading to identified dispersed campsites is allowed for the purpose of dispersed camping within 300 feet of designated routes open to motorized use.
- Post heritage resource protection signs at sites shown to have problems with vandalism.
- Maintain a Forest Service field presence for enforcement and education.
- If monitoring determines that trumpeter swans have returned to nesting territories on Elk Lake, implement an area closure to boating and fishing on the north end of Elk Lake within 1500 feet of the nest site between April 1 and July 15. Implement public education with signing and/or brochures.

Alternative C

This alternative would limit all wheeled motorized travel to the existing designated system of roads and trails by closing all unauthorized (non-system) routes to motorized use.

In Table 4 below, is a summary of the proposed changes as compared to the No Action Alternative.

Table 4. Alternative C, Summary of Changes from Alternative A

Alternative C Change Summary	Miles
Close un-authorized motorized routes that access dispersed camp sites.	6.7
Close un-authorized motorized roads	5.3
Close un-authorized motorized trails	3.3
No change from the existing condition	787.0

If selected, in addition to the actions described in table 4 above, this alternative would:

- Continue to allow motorized watercraft to travel at speeds that create a wake on Elk Lake.
- Replace all Area delineations and the Route and Area Restrictions identified on the 2008 Beaverhead-Deerlodge Travel Plan Map (2008 BDTPM) and September 2009 Errata with route specific designations as displayed in the VT/SOU Map Code Key in Appendix B. This applies to the Madison Ranger District only.
- In both the Gravelly and Tobacco Root Landscapes, close all unauthorized routes leading to identified dispersed campsites.
- Post heritage resource protection signs at sites shown to have problems with vandalism.
- Maintain a Forest Service field presence for enforcement and education.
- If monitoring determines that trumpeter swans have returned to nesting territories on Elk Lake, implement an area closure to boating and fishing on the north end of Elk Lake within 1500 feet of the nest site between April 1 and July 15. Implement public education with signing and/or brochures.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in tables 5, 6, and 7 are focused on activities and effects where different levels of effects or outputs can be distinguished among alternatives.

Table 5. Comparison of Alternatives –Transportation System on the Madison Ranger District

Transportation System on the Madison Ranger District By Alternative				
	Alt A	Alt B	Alt B Modified	Alt C
System roads open to motorized use	549.4	436.8	449.5	549.4
System trails open to motorized use	174.3	266.5	252.4	174.3
Unauthorized roads open to motorized use	12	0.0	0.0	0.0
Unauthorized trails open to motorized use	3.3	0.0	0.0	0.0
TOTAL ROUTES OPEN	*739.1*	*703.3*	*701.9*	*723.7*
System roads closed to motorized use	100.4	117	119	100.4
System trails closed to motorized use	392.6	404.4	402.6	392.6
Unauthorized roads closed to motorized use	210.1	213.3	213.3	222.2
Unauthorized trails closed to motorized use	67.3	67.3	68.5	70.6
Routes decommissioned	0	4.2	4.2	0
TOTAL ROUTES CLOSED	*770.4*	*806.2*	*807.6*	*785.8*
TOTAL MILES OF ROUTES IN PROJECT AREA	1509.5	1509.5	1509.5	1509.5
PERCENT ROUTES OPEN	49%	47%	46%	48%
PERCENT ROUTES CLOSED	51%	53%	54%	52%
Motorized Access to Dispersed Camping	Please See Alternative Descriptions	Please See Alternative Descriptions	Please See Alternative Descriptions	Please See Alternative Descriptions
"No Wake" Speed Restriction for Motorized Watercraft on Elk Lake	No	Yes	Yes	No

Table 6. Comparison of Alternatives – Changes to the Motorized Transportation System on the Madison Ranger District

Change to the Motorized Transportation System on the Madison Ranger District By Alternative	Miles			
	Alt A	Alt B	Alt B Modified	Alt C
Add dispersed site access as system motorized trails	0	6.7	6.6	0.0
Add un-authorized roads as system motorized roads	0	1.8	1.9	0.0
Add un-authorized trails as system motorized trails	0	3.6	3.6	0.0
Close un-authorized roads to motorized use	0	3.3	3.4	5.3
Close un-authorized trail to motorized use	0	0	0	3.3
Close un-authorized motorized routes that access dispersed camp sites	0	0	0	6.7
Close existing system roads to motorized use	0	18.7	22.0	0

Change to the Motorized Transportation System on the Madison Ranger District By Alternative	Miles			
	Alt A	Alt B	Alt B Modified	Alt C
Close existing system trails to motorized use	0	9.9	9.9	
Remove existing system roads from the system (decommission)	0	4.2	4.2	0
Convert existing system motorized roads to system motorized trails	0	93.6	77.8	0
Change VT/SOU on existing motorized routes	0	47.3	116.8	0
Convert maintenance level 2 or 3 roads to maintenance level 1 roads	0	18.2	21.9	0
No Change From Alternative A	802.4	615.4	558.3	787.0

Table 7. Comparison of Alternatives – Whether Purpose and Need is met by Alternative

Purpose and Need	Does Alternative Meet Purpose and Need?			
	Alternative A	Alternative B	Alternative B Modified	Alternative C
Comply with the 2009 Revised Beaverhead-Deerlodge Land and Resource Management Plan (Forest Plan) Forestwide and Management Area goals, objectives and standards (Ch. 3 and 4).	No – Does not meet Forest-wide or Management Area Goals, Objectives, Standards.	Yes – Meets Forest-wide Goals, Objectives, Standards. No – Does not meet Management Area Standards	Yes – Meets Forest-wide and Management Area Goals, Objectives, Standards. See Appendix F Forest Plan Consistency Table for specific standards.	No – Does not meet Forest-wide or Management Area Goals, Objectives, Standards.
Comply with the November 2005 Travel Management Rule (2005 TMR) and the production of a Motor Vehicle Use Map (MVUM) for the Madison Ranger District.	No – Does not designate routes as system instead leaving unauthorized routes	Yes – Designates routes as system	Yes - Designates routes as system	Yes – Designates routes as system

Purpose and Need	Does Alternative Meet Purpose and Need?			
	Alternative A	Alternative B	Alternative B Modified	Alternative C
Better protect natural resources.	No – Does not address resource-based issues associated with both existing system routes and unauthorized routes	Yes – Addresses resource-based concerns for specific routes by changing VT/SOU or closing of route segments	Yes – Better addresses resource-based concerns for specific routes by changing VT/SOU or closing closure route segments	No – Does not address resource-based concerns for existing system routes
Improve recreation management related to motor vehicle use.	No – Does not address inconsistencies between adjacent ownerships, or make decisions about unauthorized routes.	Yes – Alleviates current inconsistencies between adjacent ownerships. Clarifies allowances for all designated routes and motorized access to dispersed camping.	Yes – Alleviates current inconsistencies between adjacent ownerships. Clarifies allowances for all designated routes and motorized access to dispersed camping.	Yes – Results in a system of designated routes. No – Does not address need for designation of motorized routes to dispersed campsites. Does not address inconsistencies between adjacent ownerships.
Decrease user conflicts	No – Does not decrease user conflicts. Does not address wheeled motorized use SOU on groomed snowmobile routes.	No – Does not alleviate wheeled motorized use on groomed snowmobile routes. Yes – Does address some user conflicts and alleviates inconsistencies between adjacent ownerships.	Yes –. Addresses user conflicts including wheeled motorized use on groomed snowmobile routes and alleviates inconsistencies between adjacent ownerships.	No – Does not reduce user conflicts. Does not address wheeled motorized use SOU on groomed snowmobile routes.

Table 8. Comparison of Alternatives by Vehicle Type (VT)/Season of Use (SOU) Code

Vehicle Type	Season of Use	EA Map Code	Alt A Miles	Alt B Miles	Alt B mod Miles	Alt C Miles
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	All Year	A1	261.2	229.7	170.7	256.1
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	June 1 - March 31	A2	15.3	10.3	9.0	15.3
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	June 1 - Oct 15	A3	28.6	4.9	4.9	25.4

Vehicle Type	Season of Use	EA Map Code	Alt A Miles	Alt B Miles	Alt B mod Miles	Alt C Miles
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	July 1 - March 31	A4	199.4	139.5	147.2	196.2
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	May 15 - Oct 15	A5	14.0	14.3	12.9	13.8
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	Dec 1 - Oct 15	A6	24.3	30.2	30.2	24.0
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	May 15 - Dec 1	A7	13.0	6.8	9.6	13.0
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	May 1 - Dec 1	A8	0	1.1	7.7	0
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	July 1 - Oct 15	A9	5.6	0	0	5.6
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	Admin / Permitted Use Only	A15	63.3	63.3	63.1	63.3
Highway Vehicle / Motor Vehicle / ATV / Motorcycle	April 1 - December 31	A16	0	0	57.3	0
Motor Vehicle / ATV / Motorcycle	All Year	B1	0.5	20.5	15.1	0.5
Motor Vehicle / ATV / Motorcycle	June 1 - March 31	B2	0	2.1	4.1	0
Motor Vehicle / ATV / Motorcycle	June 1 - Oct 15	B3	4.6	5.5	2.7	3.9
Motor Vehicle / ATV / Motorcycle	July 1 - March 31	B4	0.1	51.2	43.3	0.1
Motor Vehicle / ATV / Motorcycle	Dec 1 - Oct 15	B6	0	4.0	4.0	0
Motor Vehicle / ATV / Motorcycle	May 15 - Dec 1	B7	0	2.5	2.1	0
Motor Vehicle / ATV / Motorcycle	May 1 - Dec 1	B8	0	6.7	0	0
Motor Vehicle / ATV / Motorcycle	July 1 - Oct 15	B9	0	5.6	5.6	0
Motor Vehicle / ATV / Motorcycle	April 1 - Dec 31	B16	0	0	6.6	0
ATV / Motorcycle	All Year	C1	88.8	85.7	85.1	88.7
ATV / Motorcycle	June 1 - Oct 15	C3	0	2.0	2.0	0
ATV / Motorcycle	July 1 - March 31	C4	0	8.5	8.5	0
ATV / Motorcycle	May 15 - Sept 10	C10	14.6	0	0	14.6
ATV / Motorcycle	Jun 1 - Sept 10	C11	3.9	1.5	1.5	3.9
ATV / Motorcycle	Dec 1 - Sept 10	C12	17.1	15.8	15.8	14.7
ATV / Motorcycle	May 1 - Sept 9	C14	0	14.6	14.6	0
Motorcycle	All Year	D1	33.9	30.0	31.1	33.9
Motorcycle	Dec 1 - Sept 10	D12	8.3	8.3	8.3	8.3
Motorcycle	Aug 1 - Feb 15	D13	5.7	1.9	1.9	5.7
Total Motorized Route Mileage			802.3	766.6	765.0	787.0

Environmental Effects Analysis

Introduction

Direct, indirect and cumulative effects are summarized below. Relevant past, present, and reasonably foreseeable actions considered in the cumulative effects analyses are detailed in Appendix E. The effects of the 2009 Forest Plan ROD 2 are fully analyzed and disclosed under the cumulative effects sections of each resource effects analysis.

The analysis for this project tiers to the Corrected Final Environmental Impact Statement (2009 CFEIS) for the 2009 Forest Plan.

The best available science has been used in the analysis of this project. Additional documentation, including detailed analyses of project area resources, can be found in the Project File located at the Supervisor's Office in Dillon, Montana.

NOTE: *All numbers displayed in this document including appendices have been rounded to the nearest tenth for ease of display. In some cases the totals shown in tables may not equal the sum of the rounded numbers. This is due to the fact that the totals displayed in tables have been calculated using the unrounded raw data numbers; in these cases the reader is reminded that simply adding the rounded numbers may not represent the actual sum of the unrounded numbers used to calculate a total. Unrounded raw data numbers are available in the project file upon request.*

Recreation

Existing Condition

Introduction and Description of the Analysis Area: The Madison Ranger District offers a variety of recreational experiences. One can fish high mountain lakes, or wade into the world-famous trout waters of the Madison River. Rugged adventurers might lead a pack string along isolated ridges or backpack in the quiet solitude of wilderness. Those seeking more accessible activities can camp at developed sites or drive the high Gravelly Range Road with its commanding view of ever receding mountain ranges. The Madison and Ruby Valleys are not major population centers, and local tourism is focused mostly on Yellowstone Park and Virginia City. This may account for the feeling of not being crowded when recreating on the Madison Ranger District, as voiced by visitors to campground hosts.

As identified in the 2009 Beaverhead-Deerlodge National Forest Land and Resource Management Plan (Forest Plan), the project area is covered by three Landscapes, twenty seven Management Areas (See Appendix A, General Landscape and Management Area map), and nine Hunting Units (See Appendix A for map). The Madison Ranger District is also part of the Greater Yellowstone Ecosystem (see wildlife specialist report for details).

Recreation opportunities on the Madison District occur in primitive settings that include wilderness and backcountry areas, as well as in developed settings that include 14 campgrounds and picnic areas. Eight historic Forest Service ranger stations also serve the recreating public as rental cabins. There are four recreation residences located on the District. Thirty-four outfitter-guides are currently authorized to operate on the District, who provide guided services including big game hunting, auto-touring, hiking, horse riding, fishing, mountain biking, backcountry skiing and snowmobile tours. There are also three permitted resorts.

Although trend information indicates steadily increasing visitation over time, use of the Madison Ranger District, outside of hunting season, can be characterized as low to moderate. Dispersed camping (non-developed camping) occurs both in backcountry and front-country settings. Motorized and non-motorized trails provide opportunities for hunting and fishing, hiking, mountain biking, OHV use, and horse riding. The Continental Divide National Scenic Trail borders the southeast end of the District, crossing east from the Centennial Valley through Raynolds Pass. Snowmobiling and cross-country skiing are popular wintertime activities on the District.

Recreation Opportunity Spectrum and Forest Plan Direction: The Forest Service uses the Recreation Opportunity Spectrum (ROS) to match visitor's desires, abilities, and expectations to a particular activity and setting (PLAE, Inc. 1993, pp. 25-27). ROS provides a framework for stratifying and defining classes of outdoor recreation environments. The continuum of this spectrum can be defined in terms of perceivable modifications to the natural environment, such as presence of roads and trails or the existence of buildings, facilities and conveniences. Also considered in the evaluation of a setting are social factors such as remoteness, size of the space, evidence of human activity, social encounters, and managerial presence. Philosophically, the ROS is based upon the following premises:

- People purposefully choose settings for their recreation activities
- Choices are made with the expectation of achieving particular recreation experiences.
- It is desirable, from a macro-planning perspective, to present a diverse spectrum of activity and recreation setting opportunities, ranging from highly developed to primitive, from which people may choose.

ROS is designed as a spectrum with five different classes: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Rural, and Urban. The experience opportunities for each ROS class are described below.

Primitive. "Opportunity for isolation (from the sights and sounds of people), to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills" (Manning 1999). Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other area users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Motorized use within the area is not permitted.

Semi-Primitive Non-Motorized. "Some opportunity for isolation from the sight and sound of people, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills" (Manning 1999). Areas characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but is subtle. Motorized uses not permitted include airplanes, helicopters, hovercraft, etc.

Semi-Primitive Motorized. "Some opportunity for isolation from the sights and sounds of people, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area" (Manning 1999). Areas characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other area users. The areas are managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted.

Roaded Natural. "Interaction between users may be low to moderate, but with evidence of other users prevalent. Conventional motorized use is provided for in construction standards and design of facilities" (Hammitt and Cole 1998). Area is characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.

Rural – Area is characterized by substantially modified natural environment. Sights and sounds of humans are readily evident and interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people.

Urban – Area is characterized by a substantially urbanized environment, although the background may have natural –appearing elements. Vegetative cover is often exotic and manicured. Sights and sounds of humans on-site are predominant. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

The 2009 Revised Forest Plan addresses ROS and experience settings through the setting of recreation allocations, and the Goal for recreation settings (RFP pg. 29), which is to "offer a

choice of recreation settings ranging from remote backcountry to more developed front country areas. Recreation allocations use ROS concepts and definitions."

The Recreation Allocations for summer travel on the Forest are the following (RFP pg. 297):

Backcountry: Semi-primitive motorized recreation settings are provided, and offer opportunities for varied types of travel and recreational activities.

Non-Motorized: Semi-primitive non-motorized recreation settings offer opportunities for mountain biking, horse and stock travel, hiking, dispersed camping, and other activities. These allocations are intended to provide secure wildlife habitat especially in areas which link landscapes. They also offer quiet summer and fall recreation opportunities and desirable semi-primitive settings.

Recommended Wilderness: Semi-primitive non-motorized settings are provided, and offer opportunities for foot, stock, ski, snowshoe travel, dispersed camping, and other activities.

Road-based: Roaded natural and rural recreation settings are provided, and offer a wide variety of opportunities for dispersed and developed recreational activities.

Wilderness: Primitive and semi-primitive non-motorized settings are provided, and offer opportunities for foot, stock, ski, snowshoe travel, dispersed camping, and other activities allowed in Wilderness. These lands, designated as Wilderness by Congress, are the same in all alternatives.

Wilderness Study Area: Semi-primitive non-motorized and semi-primitive motorized settings are provided. Some opportunities are available for wheeled motorized travel on routes as shown on the travel plan and non-motorized travel is available yearlong.

Throughout the RFP, the recreation setting is described for each Management Area across the Forest, and the recreation Goal (RFP pg. 29) provides a table of activities available in summer allocations.

2009 Forest Plan Interim Roads and Trails Inventory: The 2009 Forest Plan Interim Roads and Trails Inventory GIS Layer displayed on page 53 of the Forest Plan (Interim Inventory) was developed through the Forest Planning process and serves as the interim route (road and trail) inventory for the Forest including the Madison Ranger District. Motorized vehicles are currently restricted to these routes. 2009 Forest Plan Recreation Standard #3 also restricts wheeled motorized travel to designated routes.

The existing motorized restrictions for routes included in the Interim Inventory including Season of Use and Vehicle Type is determined using the 2009 Beaverhead-Deerlodge National Forest North, Central, and South Travel Plan Maps (2009 BDTPM). See Appendix B, the Map Packet, for specific route VT/SOU. Of note is that these maps identify when routes are closed. By contrast, and consistent with the TMR (Subpart B, 212.50), all action alternatives in this document identify miles by Vehicle Type/Season of Use for when routes are open (See Appendix B. See Appendix D for Alternative B Modified).

Demographic Changes, Local vs. Regional Visitation, and Resulting Use Trends: Summer visitation has historically been primarily a "backyard" type of recreation with many if not most visitors hailing from local communities. This trend is based on observations by seasonal recreation crews and campground hosts over the years. However in recent years increased population growth in the region and discovery of the Madison Ranger District as a recreation destination by non-local users has resulted in some changes to the recreation user experience.

One primary reason for this apparent change has been the rapid rate of growth in nearby Gallatin County. According to the Gallatin County Planning Department, population increased 32.4% between 2000 and 2008, and now stands at 90,000. Belgrade has been the state's fastest growing community in recent years. The Bozeman/Belgrade urban area is less than an hour's drive from the Madison Ranger District. Butte is also within an hour's drive of the District. It is evident to long time employees on the District and community members that recreation use on the Madison Ranger District is increasing for all types of recreation. Summer recreation crews have observed increases in traffic on the Gravelly Range Road. More people are entering the Lee Metcalf Wilderness to climb Sphinx Mountain as observed by the signatures at the trailheads. More ATV's, motorcycles, horses, and bicyclists are seen on the roads and trails. There are more anglers on the lakes and streams and more campers at the developed and dispersed sites. District front office personnel are fielding inquiries about recreation opportunities with ever-greater frequency. Over all, based on observations by Forest Service personnel including seasonal summer crews, campground hosts, and law enforcement, the use of the Madison Ranger District for recreation activities is increasing.

Motorized use is no exception to this growth trend. As identified in the economics section of the Updated EA, the average annual growth rates for ATVs, snowmobiles, and motorcycles from 1992-2004 in Montana was 9.7%, 5.4%, and 7.3%, respectively. This compares to an average annual population growth rate in Montana of approximately 1% (but roughly 6.3% average annual population growth in the economic impact area) during this time.

Developed Camping

Camping is a popular recreation activity within the project area and the Madison District has 14 developed campgrounds and picnic areas, which offer a variety of recreation settings, ranging from more primitive and rustic to sites that are more developed in their construction and available amenities. All of these sites are located in summer motorized allocations and include the following:

- Balanced Rock Campground and Picnic Area
- Bear Creek Campground and Picnic Area
- Branham Lakes Campground and Picnic Area
- Cliff Point Campground
- Clover Meadows Campground and Picnic Area
- Cottonwood Campground
- Elk Lake Campground and Picnic Area
- Hilltop Campground
- Madison Campground
- Mill Creek Campground
- Potosi Campground and Picnic Area
- Riverview Campground
- Wade Lake Campground and Picnic Areas
- West Fork Madison Campground

Dispersed Camping

There are also popular dispersed camping sites adjacent to many roads within the analysis area, with moderate to heavy dispersed camping use throughout the summer. Many sites are especially popular for dispersed camping during the fall big-game hunting season.

Dispersed camp sites offer no constructed amenities or developments, and are located across the District within each of the recreation allocations set by the RFP. Dispersed campsites that are located in Wilderness, summer non-motorized, and backcountry allocations generally offer a more primitive recreation experience, and backcountry allocations allow dispersed camping to be accessible by motorized vehicles. These three allocations also offer greater opportunity for solitude, depending on proximity to popular trailheads and other recreation destinations that potentially increase encounters with other people. Dispersed campsites that are located in road based allocations generally have less opportunity for solitude, due to higher amounts of vehicle traffic and closer proximity to developments.

Although dispersed camping is allowed anywhere on the District, motorized access to these sites is currently limited by access restrictions that vary by landscape and in some cases, by route. In the Gravelly Landscape, dispersed camping has been restricted over time to those sites which are identified with a Forest Service campsite marker. The routes leading to them are currently unauthorized (non-system) routes. Also in the Gravelly landscape and consistent with Management Area Standards for the Snowcrest Recommended Wilderness, dispersed camping is allowed within 300' of The Notch Road and where marked along the Antone Station Road (RFP pg. 153). In areas outside the Gravelly Landscape, including the Tobacco Root landscape, motorized access to dispersed camping sites is consistent with the interim allowance described under Recreation Standard #3 (RFP pg. 32): "Motorized wheeled travel on routes leading to identified dispersed campsites is allowed." Dispersed camping by non-motorized means is allowed anywhere on the District.

Wake-Speed Motorized Watercraft Recreation

The Chain of Lakes MA (Forest Plan, Ch. 3, page 135) is comprised of Elk, Cliff, Wade, and Hidden Lakes. Hidden Lake is closed to gasoline motors year long, and a "No-Wake" restriction was implemented for Cliff and Wade Lakes in 1993 (2009 BDTPM). Elk Lake is currently a "Wake Lake" where people are allowed to use motorized watercraft at speeds that produce a wake (typically in the form water skiing and jet skiing).

Elk Lake is accessed by Forest Service roads, via the Centennial Valley, and is situated in a secluded setting. It is located in the Gravelly Landscape, in the Chain of Lakes MA (RFP pg. 135), and the greater part of the lake, northeast of "The Narrows" is located in a backcountry (ROS- semi-primitive) summer allocation. Recreation Standard #9 (RFP pg. 32) requires: "Manage summer backcountry allocations for a semi-primitive motorized setting from May 16 through December 1". Disturbance from the noises, speeds and activity associated with wake speed water recreation, and the large areas needed to conduct the activity, make wake speed water recreation inconsistent with this backcountry management standard.

According to the owners of the Elk Lake Resort, there are two groups of guests who engage in water skiing or jet skiing about one week per year. The general public is not known to participate in wake speed recreation activities at Elk Lake. There are nearby opportunities for wake speed watercraft recreation such as water skiing and jet skiing at Hebgen Lake, Henry's Lake, and Island Park Reservoir.

Winter Recreation Use

During the winter most roads and summer trails, even if otherwise unrestricted, are closed due to snow. Snowmobiling and cross-country skiing are popular winter recreation activities that occur within the project area. Although winter recreation is not part of this decision, winter recreation destinations are accessed via roads and trails, and winter recreational uses may occur on roads

and trails. There are several trailheads and marked/ mapped snowmobile trails on the District. Currently wheeled motor vehicles are not restricted from all of the groomed routes. Trail grooming occurs on the Kid Mountain Loop in the Tobacco Roots Landscape and on portions of the Standard Creek/Lobo Mesa and Vigilante snowmobile trails in the Gravelly Landscape.

Hunting and Fishing

Hunting use can become concentrated on the Madison District during the general season big game hunts. Hunting for elk, deer, antelope, mountain lion, black bear, moose, sheep, goat, waterfowl and upland game bird hunting occurs within the project area.

Since the 1980s, numbers of elk hunters state-wide have hovered steadily between 100,000 and 120,000. During that same period, numbers of elk hunters in Region 3 (southern Montana) rose from roughly 35,000 to over 50,000. Today approximately 50% of the state-wide elk harvest occurs in southwestern Montana, and Region 3 has maintained the highest harvest numbers for over 30 years (FWP, 2004). Hunters descend upon the Madison District each fall, coming from all over the country, in hopes of filling an elk tag.

Many hunters use horses or ATVs, and conflicts between motorized and non-motorized visitors, although not profound, are most pronounced during hunting season. Increasing hunter frustrations over conflicts and perceptions of crowding has been noted by state wildlife management officials, as well (FWP, 2004). Travel plan violations are also more commonly observed and reported during this time of year. Many roads and trails that are open in summer are closed during hunting season to improve wildlife security and reduce use conflicts. Off-road game retrieval by motorized means is not allowed anywhere on the District. Hunting season is also an active time for the District's permitted outfitters and guides, several of whom also are packers permitted for game retrieval, available for hire.

During the general big-game hunting season (typically the last week of October to the last week of November) there are 617.8 miles of roads and trails open to motorized use. As identified on the 2009 BDTPM the District opens access to permitted disabled hunters behind closed gates in three locations. These areas still have the restriction for no off-road travel. Disabled hunters must remain on system roads and are not allowed to drive off of these routes.

The District is also popular for fishing, having several world-class trout streams located here. High mountain lakes also offer numerous fishing opportunities that are accessed both by motorized and non-motorized means.

Inventoried Roadless Areas

Inventoried Roadless Areas are inventoried tracts of National Forest System land characterized as having an undeveloped character. On the Beaverhead and Deerlodge Forests, IRAs were initially identified during the Roadless Area Resource Evaluation of 1972 (RARE I) and the RARE II of 1979. These inventories were updated and the areas evaluated for wilderness suitability as part of the initial forest planning efforts completed for the Beaverhead National Forest in 1986 and the Deerlodge National Forest in 1987. As part of the 2009 revised forest plan process, these inventories were again reviewed, updated, and reevaluated for wilderness suitability.

The criteria for determining whether an area of the National Forest System qualifies as an IRA are provided in FSH 1909.12 which states:

"Roadless areas qualify for placement on the inventory of potential wilderness if, in addition to meeting the statutory definition of wilderness (Section 2 (c) of the 1964 Wilderness Act), they meet one or more of the following criteria:

1. They contain 5,000 acres or more.
2. They contain less than 5,000 acres but:
    a. Due to physiography or vegetation, they are manageable in their natural condition.
    b. They are self-contained ecosystems such as an island.
    c. They are contiguous to existing wilderness, primitive areas, Administration-endorsed wilderness, or roadless areas in other Federal ownership, regardless of their size.
3. They do not contain improved roads maintained for travel by standard passenger-type vehicles, except as permitted in areas east of the 100th meridian."

In addition to the above criteria, IRAs contain important environmental values that warrant protection. These include values or features that characterize IRAs (36 CFR 294.11), as well as attributes that characterize wilderness potential (FSH-1909.12.7). The wilderness suitability of each IRA was evaluated during the forest plan revision process, using the elements of Capability, Availability, and Need described in FSH 1909.12.7. Detailed information of this process can be found in the Revised Forest Plan FEIS pg. 278 and the Evaluations of each IRA can be found in the FEIS Appendix C.

Motorized activity is not prohibited solely because an area is classified as an IRA (2009 RFP, Corrected FEIS pg. 277). In this project area there is a total of 281.5 miles of unimproved routes open to motorized use in IRAs on the District. Of the 281.5 miles in IRAs, 3.7 miles of this total are currently unauthorized routes, 3 miles of which provide access to existing dispersed campsites.

There are 14 IRAs covering a total of 414,219 acres on the Madison District. The following table lists the IRAs on the District and the total acreage associated with each. Detailed information regarding Forest-wide evaluation of each IRAs can be found in the Revised Forest Plan, FEIS (2009 RFP, Corrected FEIS, and Appendix C).

Table 9. IRAs and their Acreage on the Madison Ranger District

IRA Name	Acres
Big Horn Mountain (1-024)	53,494
Black Butte (1-026)	39,252
Cherry Lakes (1-023)	13,070
Cowboy Heaven (1-030)	6,916
Crockett Lake (1-022)	6,906
Freeze Out Mountain (1-029)	98,747
Lone Butte (1-028)	13,904
Madison (1-031)	12,230
Middle Mountain Tobacco Roots (1-013)*	59,732
Mount Jefferson (1-962)	4,448
Potosi (1-014)	5,296
Sheep Mountain (1-021)	29,395
Snowcrest Mountain (1-025)	97,985
Vigilante (1-024)	15,754
Total acres	457,129

*Acreage for the Middle Mountain Tobacco Roots IRA is only for the portion located on the Madison District.

Road and Trail Use

The project area includes access roads (including arterial and collector roads) that are used for a variety of recreational purposes, such as accessing developed and dispersed recreation sites, as well as viewing scenery, hunting, and licensed use of ATVs and motorcycles. Montana state law restricts motorized use on all public roads to street legal vehicles. This means that:

- OHV's must be registered as a motor vehicle (have a license plate);
- Operators must have a valid driver's license;
- The OHV must have a rear view mirror, horn, headlight, taillight and brake light.
- Non-street legal vehicles in Montana can only operate on designated motorized trails or areas, provided they have an off-highway vehicle decal.

Trails within the analysis area also receive use throughout the summer and fall season by hikers, mountain bikers, ATV and motorcycle riders, and horseback riders. The majority of the trails on the District are Trail Class 3. The Trail Class reflects the trail development. Trail Class is used to identify the applicable Design Parameters and costs for meeting the National Quality Standards for Trails (FSH 2309.18, Ch. 10). There are five classes ranging from Trail Class 1 to Trail Class 5. Trail Class 1 includes the least developed and most challenging. Trails in this category are typically very rugged and steep, with little or no defined tread, or clearing, and have continuous obstacles. Trail Class 5 includes the most highly developed and least challenging. Trails in this category are typically wide, paved, and heavily used and are often fully handicapped accessible. There are no Class 4 or 5 trails on the District.

There are 1509.5 miles of roads and trail (routes) on the District. See Table 1 for a detailed breakdown that shows number of miles of road and trail by system and motorized status.

Based on the data in Table 5, 49% of the roads and trails on the District are open for motorized use and 51% are closed to motorized use.

Routes identified as closed are not open to the public for motorized use, but are open for non-motorized use. There are 63.3 miles of road (A15) closed to the public for motorized use, but open for administrative or permitted motorized use. In the recreation analysis, these miles are included in those considered closed to motorized use.

Trails Maintenance: An objective of the 2009 RFP (pg. 31) is that all system trails, motorized and non-motorized, will be maintained to Forest Service standards, appropriate to a range of trail conditions, from primitive native surfaced routes to higher level improved surfaced routes. Much of the improvement associated with bringing individual trails up to standard falls within the category of routine maintenance and is funded annually, as appropriated. Trail maintenance standards are set by their maintenance level or trail class and are described in FSH 2309.18.

Table 10 below represents the Beaverhead-Deerlodge National Forest accomplishment reports for Miles of Trail Maintenance Maintained to Standard and Miles of Trail Improved to Standard from 2006-2010.

Table 10. Miles of Trail Maintained and Improved to Standard on the Beaverhead Deerlodge and Madison Ranger District 2006-2010*

Fiscal Year	Forest-Wide Target (Miles)	Forest-Wide Accomplishment (Miles)	Forest-Wide % of Target Accomplished (Miles)	Madison District Accomplishment (Miles)
2006	468	1271.7	272%	257
2007	585	868.55	148%	327

Fiscal Year	Forest-Wide Target (Miles)	Forest-Wide Accomplishment (Miles)	Forest-Wide % of Target Accomplished (Miles)	Madison District Accomplishment (Miles)
2008	795	1351.6	170%	112.3
2009	1181	1326	112%	350
2010	1250	1302	104%	369

*Trails include motorized and non-motorized trails.

Miles of Trail Maintained to Standard = miles of trails receiving maintenance. This measure includes annual maintenance and deferred maintenance (repair, replace, and decommissioned). This is the annual amount of maintenance accomplished with annual appropriations.

Miles of Trail Improved to Standard = miles improved or constructed to standard. This measure includes trail alteration, expansion or new construction. This is the annual amount of improvement or construction accomplished with annual appropriations.

Effects Analysis

Geographic scope of analysis:

The geographic scope of this analysis for the direct and indirect effects for recreation occurs within the boundaries of the Madison Ranger District. The cumulative effects analysis area includes a consideration of lands managed by other agencies proximal to the Madison Ranger District including neighboring National Forests, lands managed by the Department of Interior Bureau of Land Management (BLM), and State Lands and as described in further detail in the cumulative effects section of this recreation analysis.

Analysis Methods:

The recreation analysis estimates potential effects on the recreation resources by calculating and comparing the quantitative changes in miles of routes open or closed, vehicle type (VT) allowed on a route, and season of use (SOU). This is combined with qualitative information about recreation experiences, opportunities and trends, as described in the existing condition section above.

Please refer to the tables 1 through 8 in the "Alternatives" and "Comparison of Alternatives" sections of this document that display existing condition miles and changes by alternative and table 14 which displays the cumulative total of miles of routes open and closed to motorized use in the project area.

Effects Common to All Alternatives:

Developed Camping

Motorized access to all developed campgrounds on the District would continue as currently managed, because the access routes leading to them are all currently NFS system routes, which would remain open under all alternatives. There would be no change to current developed recreation opportunities or experiences under any alternative.

Non-Motorized Means of Recreation

Non-motorized means of recreation would continue to be allowed across the District under all alternatives. With the exception of designated and proposed wilderness (no bicycles allowed), cross-country travel on foot, horseback, snowshoe, skis, and bicycle is allowed across the District.

These modes of travel would also continue to be allowed on NFS roads and motorized trails, as well as on non-motorized routes.

Recommended Wilderness and Non-Motorized Allocations

This project will not change any decisions made as part of the 2009 Revised Forest Plan (RFP) (see page 5 of EA). The RFP recommended areas for wilderness and established non-motorized allocations within the Madison Ranger District. These areas will be closed to wheeled motorized use regardless of which alternative is selected for this project. Decisions regarding closure of routes to motorized use within these RFP allocations have been made through the Forest Planning process, the effects of which are disclosed in the CFEIS for the 2009 Forest Plan. The cumulative effects of the ROD 2 decision in combination with the various alternatives analyzed in this document can be found in the cumulative effects sections of this analysis.

Alternative A - No Action

Direct and Indirect Effects:

Dispersed Camping

Motorized access to dispersed camping sites in the Gravelly Landscape would continue to follow current management which allows motorized access to occur provided that the sites are designated with a campsite marker. Also in the Gravelly landscape and consistent with Management Area Standards for the Snowcrest Recommended Wilderness, dispersed camping would continue to be allowed within 300' of The Notch Road and where marked along the Antone Station Road (RFP pg. 153).

In the Tobacco Root Landscape, motorized access to dispersed camping sites would continue consistent with the interim allowance described under Recreation Standard #3 (RFP pg. 32): "Motorized wheeled travel on routes leading to identified dispersed campsites is allowed." No requirement that motorized users use existing routes or that they be on those routes for the purposes of dispersed camping would exist. Additionally, no distance limitation for accessing dispersed campsites from open designated roads would be set under this No Action alternative.

The public would continue to have the same access currently available to dispersed campsites in the Gravelly and Tobacco Root landscapes. None of the routes to these campsites would be designated or placed on the transportation system.

Wake-Speed Water Recreation

Under this alternative, Elk Lake would remain a "wake lake" where people are allowed to use motorized watercraft at speeds that produce a wake. The direct and indirect effect of continuing motorized watercraft speeds on Elk Lake would be an ongoing inconsistency with the quiet, secluded recreation setting of the Centennial Valley and the greater portion of the lake northeast of "The Narrows", which is located in a backcountry (ROS- semi-primitive) summer allocation. Recreation Standard #9 (RFP pg. 32) requires: "Manage summer backcountry allocations for a semi-primitive motorized setting from May 16 through December 1". Disturbance from the noises, speeds and activity associated with wake speed water recreation, and the large areas needed to conduct the activity, make wake speeds inconsistent with this backcountry management standard. Those desiring a quieter experience at Elk Lake could be disturbed by the higher noise level and waves created by the wake speed motorized activities.

Wake speed motorized watercraft opportunities would remain available at Elk Lake as well as being available in the general area at Hebgen Lake, Henry's Lake, and Island Park Reservoir.

Winter Recreation

Snowmobiling and cross-country skiing on the District would continue as currently managed under the existing condition. The routes leading to the trailheads accessing winter trail networks are all currently NFS system routes, which would remain open under the No Action. Winter recreation activities that occur over NFS roads or trails, or over unauthorized routes, will continue. There would be no change to current winter recreation opportunities or experiences under the No Action.

Driving wheeled vehicles on groomed snowmobile trails is an activity enjoyed by a few four wheel drive enthusiasts, but can result in user conflicts, wheel rutting and other expensive damage to grooming investments, and is a public safety concern. Alternative A would result in no restriction to this conflicting activity. Without changes to vehicle type and season of use restrictions, this conflict between wheeled motorized and snowmobile use on designated routes would continue.

Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) are inventoried tracts of land characterized as having an undeveloped character. Motorized activity is not prohibited solely because an area is classified as an IRA (RFP, CFEIS pg. 277). In this project area there is a total of 281.5 miles of unimproved routes open to motorized use in IRAs on the District. Of the 281.5 miles in IRAs, 3.7 miles of this total would remain unauthorized routes under this alternative. This project does not propose to construct any new, or reconstruct any existing roads or trails nor will this alternative make any changes to the existing condition. The No Action alternative would have no effect on existing Roadless Character.

Road and Trail Use

This No Action alternative would continue current management, which includes a mix of National Forest System (NFS) roads and trails, as well as a number of unauthorized (non-system) motorized routes that would not be added to the Forest's transportation system. Of the 292.7 miles of unauthorized routes on the District, 15.3 miles are currently open to motorized use, and 277.4 miles are closed to motorized use.

Motorized travel would continue to be allowed as currently managed. This alternative provides the most motorized mileage because motorized travel would continue on all NFS roads and trails currently open to public motorized uses, as well as on open unauthorized routes. This No Action alternative does not propose any changes to any routes or their status and thus the total number of miles of routes open to motorized use during at least part of the year on the District would remain at approximately 739 miles, or 49% of the total miles of routes on the District.

Currently, forest visitors must refer to the 2009 BDTPM route and area restrictions, along with page 53 of the Forest Plan, to know the site-specific VT/SOU restrictions for unauthorized routes and NFS roads (shown and not shown on the BDTPM). This situation would continue under the No Action, which poses a continuing challenge for visitors to determine whether they are in compliance and for law enforcement to enforce. Some conflicts between motorized and non-motorized recreationists may also be attributed to this situation. The opportunity to clarify allowed uses and designate motorized travel would not occur under this No Action alternative.

This alternative would maintain different closure dates in the vicinity of on the Wall Creek Game Range between lands administered by the Montana Department of Fish Wildlife & Parks (FWP) and the Forest Service. FWP changed opening dates from May 16 to May 1. The opening date on

the Forest remains May 16. Different restriction dates on adjacent areas of public lands would continue to cause confusion, conflicts, and inconvenience for visitors.

Under the No Action Alternative all low standard, low speed roads would provide motorized recreational opportunities only to those whose vehicles are street legal. The level of opportunity for recreationists with non-street legal vehicles would remain the same as currently exists.

Alternative B - Proposed Action

Direct and Indirect Effects

Dispersed Camping

Motorized access to dispersed camping sites in the Gravelly Landscape would be similar to current management, but unauthorized routes that currently lead to campsites identified with a campsite marker would be designated as motorized system trails under Alternative B. Also in the Gravelly landscape and consistent with Management Area Standards for the Snowcrest Recommended Wilderness, dispersed camping would continue to be allowed within 300' of The Notch Road and where marked along the Antone Station Road (RFP pg. 153).

In the Tobacco Root Landscape, motorized access to dispersed camping sites would remain consistent with the interim allowance described under Recreation Standard #3 (RFP pg. 32): "Motorized wheeled travel on routes leading to identified dispersed campsites is allowed". Additional restrictions would be in effect under this alternative that adds to the interim allowance above. The three additional conditions for legal travel to and from dispersed campsites on these routes are: travelers must be on existing routes; they must be on them for the purpose of accessing dispersed camping; and they must not travel on these routes leading to dispersed campsites beyond a distance of 300 feet off of a designated system route open to motorized travel. The public would continue to have the same access currently available to dispersed campsites in the Gravelly and Tobacco Root landscapes but creation of new routes leading to and between dispersed campsites would be eliminated. Routes accessing dispersed campsites in the Gravelly Landscape would be designated and placed on the transportation system. These two approaches to maintain motorized access to dispersed campsites in the Gravelly and Tobacco Root Landscapes build on the interim allowance in the Forest Plan while complying with the Travel Management Rule. Non-motorized means of accessing dispersed campsites would continue to be allowed anywhere on the District.

Wake-Speed Water Recreation

Under this alternative, Wade and Cliff Lakes would continue to have a "No Wake" designation (2009 BDTPM) and Elk Lake's designation would be changed to a "No Wake Lake", where people would not be allowed to use motorized watercraft at speeds that produce a wake (roughly above 10 MPH). The direct and indirect effect of prohibiting motorized watercraft speeds on Elk Lake would include potential displacement of visitors who wish to participate in wake-speed recreational activities, such as water skiing and jet skiing. Recreational opportunities for those desiring a quieter experience would be enhanced and there would be fewer potential conflicts between high speed watercraft users and other recreationists.

Although the "No Wake" restriction may cause a loss of wake speed motorized recreational opportunity for the two groups of guests at Elk Lake Resort, the effect to the overall opportunity in the area would be minimal since wake speed motorized activities would remain available at Hebgen Lake, Henry's Lake, and Island Park Reservoir. (Please see the Social/Economic section for effects on Elk Lake Resort.).

Alternative B would provide a positive effect in creating consistency with the quiet, secluded recreation setting of the Centennial Valley and the greater portion of the lake northeast of "The Narrows", which is located in a backcountry (ROS- semi-primitive) summer allocation. Motorized watercraft activities that produce a wake are inconsistent with a backcountry summer allocation and the semi-primitive ROS class. Recreation Standard #9 (RFP pg. 32) requires: "Manage summer backcountry allocations for a semi-primitive motorized setting from May 16 through December 1". Disturbance from the noises, speeds and activities associated with wake speed motorized watercraft recreation, and the large areas needed to conduct the activities, make wake speeds inconsistent with this backcountry management standard. Those desiring a quieter experience at Elk Lake could be disturbed by the higher noise level and waves created by the wake speed motorized activities. Implementing no wake speeds on Elk Lake also provides management consistency for all lakes within the Chain of Lakes area.

Winter Recreation

Snowmobiling and cross-country skiing on the District would continue as currently managed under the existing condition. The routes leading to the trailheads accessing winter trail networks are all currently NFS system routes, which would remain open under Alternative B. Winter recreation activities that occur over NFS roads or trails, or over unauthorized routes, will continue. There would be no change to current winter recreation opportunities or experiences under Alternative B.

Driving wheeled vehicles on groomed snowmobile trails is an activity enjoyed by a few four wheel drive enthusiasts, but can result in user conflicts, wheel rutting and other expensive damage to grooming investments, and is a public safety concern. Because Alternative B includes no changes to vehicle type and season of use restrictions, conflict would likely continue where wheeled motorized use occurs on routes authorized for snowmobile trail grooming.

Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) are inventoried tracts of land characterized as having an undeveloped character. Motorized activity is not prohibited solely because an area is classified as an IRA (RFP, CFEIS pg. 277). In this project area there is a total of 281.5 miles of unimproved routes open to motorized use in IRAs on the District. Of the 281.5 miles in IRAs, 3.7 miles of this total are currently unauthorized routes, 3 miles of which provide access to existing dispersed campsites.

This project does not propose to construct any new, or reconstruct any existing roads or trails.

Under this alternative, 3.2 miles of unauthorized routes would be added as system motorized trails open to all vehicle types. Of these 3.2 miles, 3 miles would be added to the system to access existing dispersed campsites and .2 miles would be added to correct a data error related to the boundary of an IRA. Four-tenths of a mile of unauthorized route would be closed to motorized use.

28.5 miles of motorized routes in IRAs would receive a change in VT/SOU. 40.4 miles of roads within IRAs would be converted to motor vehicle trail, open to all classes of wheeled vehicles from full size highway vehicles to motorcycles. Vehicles can operate on these routes without meeting street legal requirements. This analysis considers any route open to motorized use as having equal effect to roadless character regardless of season of use or vehicle type allowed on

that route. As such, these changes are not of a nature that they would affect existing roadless character.

Overall, roadless character would be improved by closing 12.8 miles of system roads and trails to motorized use, decommissioning .6 miles of system road, and closing .4 miles of unauthorized route to motorized use. The net effect of this alternative will result in an improvement to roadless character above the existing condition as the total miles of routes available for motorized use within IRAs in the project area would decrease by 13.8 miles.

Table 11. Comparison of Alternative A (No Action) to Alternative B – Change to Routes Within IRA's in Project Area

IRA Status	Alt A to Alt B Change	Miles
In IRA	Add dispersed site access to system as trail	3.0
In IRA	Add unauthorized trail to system	0.2
In IRA	Change season of use / mode of travel	28.5
In IRA	Close system road to motorized use	7.9
In IRA	Close system trail to motorized use	4.9
In IRA	Close unauthorized road to motorized use	0.4
In IRA	Convert road to trail	40.4
In IRA	Decommission system road	0.6
In IRA	No change from Alt A	195.7
	Total miles of change	85.8

Road and Trail Use

The effects to recreation opportunities based on the proposed actions in this alternative are a slight increase in non-motorized opportunities from the No Action Alternative A, and a slight decrease in motorized opportunities. Table 5 displays the overall percentage of the open motorized routes on the District by alternative. Under this alternative, open motorized route miles decrease by approximately 2%, which results in approximately 47% of the District routes open and approximately 53% closed to motorized use. With the conversion of 93.6 miles of road to trail, there is an increase in motorized opportunities for non-street legal recreationists.

This alternative provides the least amount of motorized road mileage but the highest amount of motorized trail mileage. Of the 1,509.5 miles of roads and trails on the Madison Ranger District 703.3 miles (not including the A15 routes), or approximately 47% of the transportation system, are open to the general public for some type of wheeled motorized use for some portion of the year.

Roads: Of the 771.3 miles of road, 436.8 miles (excluding A15 roads) are open to street legal wheeled motorized use for some portion of the year. Of these open routes, approximately 53 percent (229.7 miles) are open all year, while the remaining 47 percent (207.1 miles) are seasonally restricted. During the general rifle hunting season, 49.4 miles of road open during other times of the year are closed, leaving 387.40 miles open.

Trails: Of the 738.2 miles of trail, 266.5 miles are open to wheeled motorized recreation for some portion of the year. Approximately 51 percent of the motorized trails (136.3 miles) are open all year, while the remaining 49 percent (130.2 miles) are seasonally restricted. As identified in table

8, 128.1 miles of trail are open to ATVs and motorcycles only, while 40.3 miles are open to motorcycles only. This alternative provides the least amount of single track riding opportunity. During general rifle hunting season, 209.2 miles of motorized trails are open.

Routes Open to Non-Street Legal Vehicles: This alternative expands opportunities for the use of non-street legal vehicles by converting 93.6 miles of low standard road to motorized vehicle trails. These roads converted to trails are open to all classes of wheeled vehicles from full size highway vehicles to motorcycles. Vehicles can operate on these routes without meeting street legal requirements, resulting in an increase in motorized opportunities for non-street legal recreationists.

Maintenance costs for routes converted from roads to trails would be borne by the trail program, as money allocated to road maintenance may not be used for trails under Forest Service budgetary rules. Static or declining trail budgets could impact the ability to maintain motorized trails; however, the Forest has historically over-achieved in accomplishing annual trail maintenance targets (see Table 10). The Forest has also been successful in obtaining Resource Advisory Committee (RAC) and State OHV grant awards to augment trail funding.

Additionally, the roads converted to trails are non-surfaced, relatively primitive maintenance level (ML) 2 roads which typically do not require much maintenance. Of the approximately 194 miles of road maintained annually on the Madison Ranger District, only 6% are ML 2 roads. Most maintenance is applied to higher standard ML 3 and 4 roads. The conversion of roads to trails is not likely to result in any significantly different maintenance regime.

These motorized vehicle trails are open to all vehicle classes from full sized highway vehicles to ATVs, motorcycles, and Utility Vehicles (UTVs). UTVs are similar to ATV's but have a wider wheel base, bench seating, and a steering wheel. They are not allowed on trails open to ATVs and can presently operate only on Forest roads if street legal. This alternative will provide increased opportunities for these increasingly popular machines. There is no reduction in opportunities for full sized vehicles through the conversion of roads to trails. Unlicensed operators are also permitted on motor vehicle use trails.

Montana allows ATVs to be registered as street legal vehicles. Visitors to Montana, bringing ATVs from other states where these machines cannot be registered, can now ride on 129.7 miles of trail. Under this alternative the miles available to them will increase to 226.2 miles.

Alternative B Modified

Direct and Indirect Effects

Dispersed Camping

Like Alternative B, motorized access to dispersed camping sites in the Gravelly Landscape would be similar to current management, but unauthorized routes that currently lead to campsites identified with a campsite marker would be designated as motorized system trails under Alternative B Modified. Also in the Gravelly landscape and consistent with Management Area Standards for the Snowcrest Recommended Wilderness, dispersed camping would continue to be allowed within 300' of The Notch Road and where marked along the Antone Station Road (RFP pg. 153).

In the Tobacco Root Landscape, motorized access to dispersed camping sites would remain consistent with the interim allowance described under Recreation Standard #3 (RFP pg. 32):

"Motorized wheeled travel on routes leading to identified dispersed campsites is allowed". Additional restrictions would be in effect under this alternative that adds to the interim allowance above. The three additional conditions for legal travel to and from dispersed campsites on these routes are: travelers must be on existing routes; they must be on them for the purpose of accessing dispersed camping; and they must not travel on these routes leading to dispersed campsites beyond a distance of 300 feet off of a designated system route open to motorized travel. The public would continue to have the same access currently available to dispersed campsites in the Gravelly and Tobacco Root landscapes but creation of new routes leading to and between dispersed campsites would be eliminated. Routes accessing dispersed campsites in the Gravelly Landscape would be designated and placed on the transportation system. These two approaches to maintain motorized access to dispersed campsites in the Gravelly and Tobacco Root Landscapes build on the interim allowance in the Forest Plan while complying with the Travel Management Rule. Non-motorized means of accessing dispersed campsites would continue to be allowed anywhere on the District.

Wake-Speed Water Recreation

Under this alternative, Wade and Cliff Lakes would continue to have a "No Wake" designation (2009 BDTPM) and Elk Lake's designation would be changed to a "No Wake Lake", where people would not be allowed to use motorized watercraft at speeds that produce a wake (roughly above 10 MPH). The direct and indirect effect of prohibiting motorized watercraft speeds on Elk Lake would include potential displacement of visitors who wish to participate in wake-speed recreational activities, such as water skiing and jet skiing. Recreational opportunities for those desiring a quieter experience would be enhanced and there would be fewer potential conflicts between high speed watercraft users and other recreationists.

Although the "No Wake" restriction may cause a loss of wake speed motorized recreational opportunity for the two groups of guests at Elk Lake Resort, the effect to the overall opportunity in the area would be minimal since wake speed motorized activities would remain available at Hebgen Lake, Henry's Lake, and Island Park Reservoir. (Please see the Socio-Economic section for effects on Elk Lake Resort.).

Alternative B Modified would provide a positive effect in creating consistency with the quiet, secluded recreation setting of the Centennial Valley and the greater portion of the lake northeast of "The Narrows", which is located in a backcountry (ROS- semi-primitive) summer allocation. Motorized watercraft activities that produce a wake are inconsistent with a backcountry summer allocation and the semi-primitive ROS class. Recreation Standard #9 (RFP pg. 32) requires: "Manage summer backcountry allocations for a semi-primitive motorized setting from May 16 through December 1". Disturbance from the noises, speeds and activities associated with wake speed motorized watercraft recreation, and the large areas needed to conduct the activities, make wake speeds inconsistent with this backcountry management standard. Those desiring a quieter experience at Elk Lake could be disturbed by the higher noise level and waves created by the wake speed motorized activities. Implementing no wake speeds on Elk Lake also provides management consistency for all lakes within the Chain of Lakes area.

Winter Recreation

Driving wheeled vehicles on groomed snowmobile trails is an activity enjoyed by a few four wheel drive enthusiasts, but has resulted in user conflicts, wheel rutting and other expensive damage to grooming investments, and is a public safety concern. Alternative B Modified would restrict wheeled motorized vehicles from groomed snowmobile trails between January 1 and March 31st. This new season of use (SOU) would prevent damage to snowmobile grooming,

protecting the labor and expense associated with providing that service, improving public safety, and eliminating conflicts between wheeled OHV riders and snowmobilers. The routes leading to the trailheads accessing winter trail networks are all currently NFS system routes, which would remain open under Alternative B Modified. Winter recreation activities that occur over NFS roads or trails, or over unauthorized routes, will continue. Those who enjoy using wheeled vehicles on groomed snowmobile trails would see a reduction in this recreational opportunity under Alternative B Modified. The recreational experience would improve for snowmobilers using groomed routes, due to fewer potential conflicts with wheeled motorized vehicles and better track conditions.

Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) are inventoried tracts of land characterized as having an undeveloped character. Motorized activity is not prohibited solely because an area is classified as an IRA (RFP, CFEIS pg. 277). In this project area there is a total of 281.5 miles of unimproved routes open to motorized use in IRAs on the District. Of the 281.5 miles in IRAs, 3.7 miles of this total are currently unauthorized routes, 3 miles of which provide access to existing dispersed campsites.

This project does not propose to construct any new, or reconstruct any existing roads or trails.

Under this alternative, 3.2 miles of unauthorized routes would be added as system motorized trails open to all vehicle types. Of these 3.2 miles, 3 miles would be added to the system to access existing dispersed campsites and .2 miles would be added to correct a data error related to the boundary of an IRA. Four-tenths of a mile of unauthorized route would be closed to motorized use.

41.5 miles in IRAs would receive a change in VT/SOU. 34.4 miles of roads within IRAs would be converted to motor vehicle trail, open to all classes of wheeled vehicles from full size highway vehicles to motorcycles. Vehicles can operate on these routes without meeting street legal requirements. This analysis considers any route open to motorized use as having equal effect to roadless character regardless of season of use or vehicle type allowed on that route. As such, these changes are not of a nature that they would affect existing roadless character.

Overall, roadless character would be improved by closing 14.6 miles of system roads and trails to motorized use, decommissioning .6 miles of system road, and closing .4 miles of unauthorized route to motorized use. The net effect of this alternative will result in an improvement to roadless character above the existing condition as the total miles of routes available for motorized use within IRAs in the project area would decrease by 15.6 miles. Alternative B Modified has the most positive effect upon roadless character as it would close 1.8 more miles of route to motorized use than Alternative B.

Table 12. Comparison of Alternative A (No Action) to Alternative B Modified Comparison – Change to Routes within IRA's in Project Area

IRA Status	Alt A to Alt B Modified Change	Miles
In IRA	add dispersed site access to system as trail	3.0
In IRA	add unauthorized trail to system	0.2
In IRA	change season of use / mode of travel	41.5
In IRA	close system road	9.7
In IRA	close system trail	4.9
In IRA	close unauthorized road	0.4
In IRA	convert to trail	34.4

IRA Status	Alt A to Alt B Modified Change	Miles
In IRA	decommissioned system road	0.6
In IRA	no change from alt A	186.8
	Total miles of change	94.6

Road and Trail Use

The effects to recreation opportunities based on the proposed actions are a slight increase in non-motorized opportunities from the No Action Alternative A, and a slight decrease in motorized opportunities. Table 5 displays the overall percentage of the open motorized routes on the District by alternative. Under this alternative, open motorized route miles decrease by approximately 3%, which results in approximately 46% of the District routes open and approximately 54% closed to motorized use. With the conversion of 77.8 miles of road to trail, there is a slight increase in motorized opportunities for non-street legal recreationists.

Alternative B Modified provides more miles of motorized road than Alternative B, but fewer miles of motorized trails. Of the 1,509.5 miles of roads and trails on the Madison Ranger District 701.9 miles (not including the A15 routes) or approximately 46% of the District transportation system, are open to the general public for some type of wheeled motorized use for some portion of the year.

Roads: Of the 786 miles of road, 449.5 miles (excluding A15 roads) are open to street legal wheeled motorized use for some portion of the year. Of these open roads, approximately 38 percent (170.7 miles) are open all year, while the remaining 62 percent (278.8 miles) are seasonally restricted. During the general rifle hunting season, 48 miles of road open during other times of the year are closed, leaving 401.5 miles open.

Trails: Of the 723.4 miles of trail, 252.4 miles are open to wheeled motorized recreation for some portion of the year. Approximately 52 percent of these motorized trails (131.3 miles) are open all year, while the remaining 48 percent (121.1 miles) are seasonally restricted. As identified in table 8, 127.5 miles of trail are open to ATVs and motorcycles only, while 41.4 miles are open to motorcycles only. This alternative provides the second most single-track riding opportunity. During general rifle hunting season 197.9 miles of motorized trail are open.

Routes Open to Non-Street Legal Vehicles: Like Alternative B, this alternative expands opportunities for the use of non-street legal vehicles by converting 77.8 miles of low standard road to motorized vehicle trails. These routes will provide opportunities for all classes of wheeled motorized vehicles included highway vehicles, ATVs, motorcycles and UTVs. Under this Alternative the Gypsum Road #1244, Bobcat Road #933 and Buck's Nest Road #9618 are not converted to trails because of maintenance considerations or Forest Plan direction.

Maintenance costs for routes converted from roads to trails would be borne by the trail program, as money allocated to road maintenance may not be used for trails under Forest Service budgetary rules. Static or declining trail budgets could impact the ability to maintain motorized trails; however, the Forest has historically over-achieved in accomplishing annual trail maintenance targets (see Table 10). The Forest has also been successful in obtaining Resource Advisory Committee (RAC) and State OHV grant awards to augment trail funding.

Additionally, the roads converted to trails are non-surfaced, relatively primitive maintenance level (ML) 2 roads which typically do not require much maintenance. Of the approximately 194 miles of road maintained annually on the Madison Ranger District, only 6% are ML 2 roads. Most maintenance is applied to higher standard ML 3 and 4 roads. The conversion of roads to trails is not likely to result in any significantly different maintenance regime.

These motorized vehicle trails are open to all vehicle classes from full sized highway vehicles to ATVs, motorcycles, and Utility Vehicles (UTVs). UTVs are similar to ATV's but have a wider wheel base, bench seating, and a steering wheel. They are not allowed on trails open to ATVs and can presently operate only on Forest roads if street legal. This alternative will provide increased opportunities for these increasingly popular machines. There is no reduction in opportunities for full sized vehicles through the conversion of roads to trails. Unlicensed operators are also permitted on motor vehicle use trails.

Montana allows ATVs to be registered as street legal vehicles. Visitors to Montana, bringing ATVs from other states where these machines cannot be registered, can now ride on 129.7 miles of trail. Under this alternative the miles available to them will increase to 211 miles.

Alternative C

Direct and Indirect Effects

Dispersed Camping

This alternative would not maintain existing access and instead would reduce opportunities for motorized access to dispersed campsites. Under Alternative C, no unauthorized routes, even those currently allowed for motorized travel under the existing condition, would be added to the transportation system, and would therefore be closed. In the Gravelly Range access routes to 96 dispersed sites would not be designated as motorized NFS trails open to all classes of wheeled vehicles from full size highway vehicles to motorcycles. In the Tobacco Roots, motorized travel to access dispersed campsites would not be allowed. Therefore, dispersed campsites in the Tobacco Root Landscape not immediately adjacent to open motorized routes where the public can legally park would not be accessible by wheeled motorized means.

This could adversely affect many visitors, especially during hunting season when dispersed campsites are commonly used. The loss of motorized access to campsites may lead to concentrated use in the remaining open campsites and directly adjacent to roads. Higher levels of use on fewer sites would likely increase site impacts and potentially reduce visitor satisfaction due to crowding and loss of privacy.

Wake-Speed Water Recreation

Under Alternative C, Elk Lake would remain a "wake lake" where people are allowed to use motorized watercraft at speeds that produce a wake. The direct and indirect effect of continuing motorized watercraft speeds on Elk Lake would be an ongoing inconsistency with the quiet, secluded recreation setting of the Centennial Valley and the greater portion of the lake northeast of "The Narrows", which is located in a backcountry (ROS- semi-primitive) summer allocation. Recreation Standard #9 (RFP pg. 32) requires: "Manage summer backcountry allocations for a semi-primitive motorized setting from May 16 through December 1". Disturbance from the noises, speeds and activity associated with wake speed water recreation, and the large areas needed to conduct the activity, make wake speeds inconsistent with this backcountry management standard. Those desiring a quieter experience at Elk Lake could be disturbed by the higher noise level and waves created by the wake speed motorized activities.

Wake speed motorized watercraft opportunities would remain available at Elk Lake as well as being available in the general area at Hebgen Lake, Henry's Lake, and Island Park Reservoir.

Winter Recreation

Snowmobiling and cross-country skiing on the District would continue as currently managed under the existing condition. The routes leading to the trailheads accessing winter trail networks are all currently NFS system routes, which would remain open under the Alternative C. Winter recreation activities that occur over NFS roads or trails, or over unauthorized routes, will also continue. There would be no change to current winter recreation opportunities or experiences under the Alternative C.

Driving wheeled vehicles on groomed snowmobile trails is an activity enjoyed by a few four wheel drive enthusiasts, but can result in user conflicts, wheel rutting and other expensive damage to grooming investments, and is a public safety concern. No changes to vehicle type and season of use restrictions would occur under Alternative C; therefore this conflict between wheeled motorized and snowmobile use on designated routes would likely continue.

Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) are inventoried tracts of land characterized as having an undeveloped character. Motorized activity is not prohibited solely because an area is classified as an IRA (RFP, CFEIS pg. 277). In this project area there is a total of 281.5 miles of unimproved routes open to motorized use in IRAs on the District. Of the 281.5 miles in IRAs, 3.7 miles of this total are currently unauthorized routes, 3 miles of which provide access to existing dispersed campsites.

This project does not propose to construct any new, or reconstruct any existing roads or trails.

Alternative C would not designate any of the unauthorized routes to the transportation system thereby decreasing the total open motorized routes within IRAs by 3.7 miles, a positive effect to roadless character as compared to the existing condition; however this alternative would not close any additional routes as proposed by Alternatives B or B Modified, including any existing system routes within IRAs. The overall effect of Alternative C on roadless character is less positive than the effects of Alternatives B and B Modified because these alternatives result in fewer miles of routes open to motorized use within IRA's in the project area.

Table 13. Comparison of Alternative A (No Action) to Alternative C Comparison – Change to Routes within IRA's in Project Area

IRA Status	Alt A to Alt C Change	Miles
In IRA	close dispersed site access	3.0
In IRA	close unauthorized road	0.5
In IRA	close unauthorized trail	0.2
In IRA	no change from alt A	277.3
	Total miles of change	3.5

Road and Trail Use

Alternative C reflects only the existing Forest Service system of designated roads and trails, meaning all unauthorized routes would be closed to motorized use.

The effects to recreation opportunities based on the proposed actions are a slight increase in non-motorized opportunities from the No Action Alternative A, and a slight decrease in motorized opportunities. Under this alternative, open motorized route miles decrease by approximately 1%, which results in approximately 48% of the District routes open and approximately 52% closed to motorized use. No conversion of roads to trails would occur.

This alternative would result in a reduction in motorized recreation opportunities with the closure of several loop routes, especially in the southwest Tobacco Roots. These closures would terminate many traditional uses and reduce opportunities to drive for pleasure, hunt, cut wood, and camp. Not designating existing open unauthorized routes for access to dispersed campsites could adversely affect many visitors, especially during hunting season when dispersed campsites are commonly used. Quiet recreation would be somewhat enhanced under this alternative, primarily within the southwest Tobacco Roots, by the closure of 15.3 miles of unauthorized roads and trails to motorized use.

Unauthorized routes that provide loops or connections between drainages such as the Monkey Gulch road #7304, which connects Mill Gulch to California Creek, established routes between Currant and Ramshorn Creeks, and loops in the Paymaster complex near Bivens Creek would be closed to motorized use.

Because no NFS roads would be closed under this alternative, Alternative C provides more miles available for motorized travel than do Alternatives B and B Modified, although it provides the fewest miles in motorized trails. Of the 1,509.5 miles of roads and trails on the Madison Ranger District, 723.7 miles (excluding A15 routes), or 48% of the transportation system, are open to some type of wheeled motorized use at least part of the year.

Roads: Of the 872 miles of road, 549.4 miles (excluding A15 roads) are open to street legal wheeled motorized use for some portion of the year. Of these open roads, approximately 47 percent (256.1 miles) are open all year, while the remaining 53 percent (293.3 miles) are seasonally restricted. During the general rifle hunting season, 68.8 miles of road open during other times of the year are closed, leaving 480.6 miles open.

Trails: Of the 637.6 miles of trail, 174.3 miles are open to wheeled motorized recreation for some portion of the year. Approximately seventy-one percent of the motorized trails (123.1 miles) are open all year, while the remaining 29 percent (51.2 miles) are seasonally restricted. As identified in table 8, 122 miles are open to ATVs and motorcycles only, while the remaining 47.9 miles are open to motorcycles only. This alternative provides the most miles of single-track motorcycle opportunities out of any action alternative. During general rifle hunting season 128.9 miles of motorized trail are open.

Routes Open to Non-Street Legal Vehicles: Alternative C would not expand opportunities for non-street legal machines. Alternative C would continue to allow use of non-street legal vehicles on 174.3 miles of motorized trail. This alternative limits visitors from states where ATVs cannot be registered as street legal vehicles and unlicensed operators, to only these motorized trails.

Cumulative Effects

Cumulative effects are those that would result from incremental effects of past, present, and reasonably foreseeable future actions on recreation experiences and opportunities. Activities such as travel management decisions on adjacent lands, vegetation management activities, wildfire and fire suppression, livestock grazing, spread of noxious weeds, and natural disturbance events have the potential to create cumulative effects to recreation experiences and opportunities. Typically, cumulative effects are limited to user satisfaction, unauthorized motorized use and a perception of reduced motorized recreation opportunities.

The 2009 Revised Forest Plan disclosed an extensive analysis of cumulative effects related to recreation including the effects of the recreation allocations and potential impacts of other actions

affecting recreation over a large analysis area. This analysis tiers to the CFEIS for the 2009 Revised Forest Plan.

Travel Management Decisions on the Beaverhead-Deerlodge National Forest and Other Lands:

All the alternatives have potential for cumulative effects in combination with travel management decisions on adjacent lands. These decisions have the potential to displace motorized users onto the open motorized routes of the Madison District. They may also set opening and closing dates for routes that are inconsistent across borders, continuing confusion for the public and decreasing the motorized recreation opportunity for longer rides and/or loops.

In February 2010, the Forest Supervisor signed the "Record of Decision Enacting Forest Plan Travel Management Direction for Certain Areas of the Beaverhead-Deerlodge National Forest" (ROD 2), which closed 32.9 miles of motorized routes located within non-motorized allocations on the Madison District. These closure miles remain constant across all alternatives. The reduction of 32.9 miles of open motorized routes by ROD 2 represents an approximately 2% decrease in the overall District route miles. This reduction, in combination with the actions proposed by alternative, results in the cumulative total motorized and non-motorized route percentages shown in table 14 below and as described in more detail below.

Table 14 below discloses a comparison of miles open by alternative, including ROD 2. Alternative A does not propose any changes to the existing condition by route mileage or VT/SOU and thereby leaves open the most motorized miles. Therefore, Alternative A would have the least cumulative effect combined with ROD 2. Alternative C would have next lowest cumulative effect combined with ROD 2, because the closure of all unauthorized (non-system) routes would result in 15.3 miles fewer routes open than under Alternative A. Alternatives B and B Modified would have the greatest cumulative effect with ROD 2, because they close the most miles of open routes. However, these cumulative effects are relatively minor as they result in an approximately 4 percent cumulative change when put into context of the total miles of routes open to motorized use on the District as displayed in table 14. Conversely, these changes constitute a positive cumulative effect to the quiet recreation resource, albeit minor.

Table 14. Cumulative Effects to Recreation Opportunities by Alternative

	Miles			
Routes and Status	**Alt A**	**Alt B**	**Alt B Mod**	**Alt C**
Existing Condition Total Motorized Routes	**739.1**	**739.1**	**739.1**	**739.1**
Total Routes closed to motorized use by alternatives	0.0	30.9	30.8	15.3
Total Routes closed to motorized use by ROD 2	32.9	32.9	32.9	32.9
Cumulative Total Motorized Routes	**706.2**	**675.3**	**675.4**	**690.9**
Cumulative Total Non-motorized Routes	803.3	834.2	834.1	818.6
Total Route Miles in Project Area	1,509.5	1,509.5	1,509.5	1,509.5
% Open Motorized Routes in Project Area	**47%**	**45%**	**45%**	**46%**
% Non-Motorized Routes in Project Area	53%	55%	55%	54%

In 2006 the Gallatin National Forest completed a Motor Vehicle Use Map for the entire Forest. The net result was a 45 mile increase in the overall amount of motorized routes, but with a 171 mile reduction of single-track motorized trails. The Tobacco Root Mountains on the Madison Ranger District lie within an hour's drive of Bozeman. Potentially, some motorcyclists from the

Gallatin Valley could be displaced to the Tobacco Roots. The east side of the Tobacco Roots, particularly in the Willow and Meadow Creek drainages, could see increased motorized activity resulting from such displacement although this increase would be expected to be minor.

The potential for cumulative effects with the Gallatin National Forest travel decision would be the same for all alternatives. However, because motorized single track is somewhat limited on the Madison Ranger District under all alternatives, it is possible that riders would head to the Whitetail-Pipestone area on the Jefferson Ranger District, which is also about an hour's drive from Bozeman, Belgrade, and Butte. Whitetail-Pipestone is a renowned motorized destination area with about 900 miles of motorized routes available; however, if single-track riders from the Madison District prefer a semi-primitive setting with greater opportunities for solitude, the Whitetail-Pipestone area may be too crowded to provide for that desired setting.

In 1997, the adjacent Targhee National Forest in Idaho completed travel planning; however only two motorized roads, #056 and #053 cross onto the Madison District. No other wheeled access exists from the (now consolidated) Caribou-Targhee National Forest. No cumulative effect would be anticipated for any of the alternatives in combination with the Caribou-Targhee Travel Planning decision.

In 2006, the BLM Dillon Field Office issued its Resource Management Plan (RMP) and Record of Decision (ROD), which included changes in travel management for BLM lands adjacent to the Madison District. Under the existing condition, 854,250 acres were managed as "limited" to designated routes for OHV use. 2,102 miles of road on BLM lands were designated as open to public travel and 242 miles of those roads designated open to travel were subject to seasonal restrictions. 46,976 acres were managed as closed to OHV use. Under the selected alternative, 826,876 acres would be managed as "limited" to designated routes for OHV use. Approximately 1,342 miles of road on BLM lands were designated as open to public travel and 159 miles of the 1, 342 miles of road were subject to seasonal restrictions. 74,350 acres would be managed as "closed" to OHV use (BLM, 2006a). The net result was a reduction in 760 miles of roads open to the public, and a reduction by 83 miles of roads that were subject to seasonal restrictions. Potentially, some motorized users from BLM lands affected by these reductions could be displaced to parts of the Madison District although use numbers and density of users on adjacent BLM lands is low, therefore any increase would be difficult to attribute to the nominal number of miles closed by the BLM RMP decision. The potential for cumulative effects with the BLM Dillon Field Office travel decision would be the same for all alternatives.

In 2009, the BLM Butte Field Office issued its Resource Management Plan (RMP) and Record of Decision (ROD), including changes in travel management for five travel management areas (BLM, 2006b). These are not adjacent to the Madison District. In the reasonably foreseeable future, travel management projects will address the remaining areas of the Field Office; however, these BLM lands are also not adjacent to the Madison District. Little effect due to motorized users displaced by Butte Field Office travel management efforts would be anticipated. The potential for cumulative effects with the BLM Butte Field Office travel decision would be the same for all alternatives.

In 1993, Madison County issued an ordinance that closed several county roads to wheeled vehicles on certain snowmobile routes, from December 1st to April 15. Only Alternative B Modified proposes changes to VT/SOU that would restrict wheeled vehicles from using certain snowmobile routes, resulting in a positive cumulative effect of greater consistency between the Madison District and the Madison County ordinance. This consistency is expected to improve the quality of snowmobile trail condition, the snowmobiling experience, and decrease user conflicts.

Vegetation Treatments

Cumulative effects of past, present and future vegetation treatment projects may occur to recreation due to temporary displacement of recreationists during operations (logging, slash management, prescribed burning, road construction). Short term noise impacts to users may occur with the use of heavy machinery, motor vehicles, and power equipment. Longer-term impacts can affect scenic quality and the recreation experience of an area, negatively or positively, depending on the activities that take place. Cumulative effects in this regard can be similar to those of wildfire, and can exist in combination with the cumulative effects of wildfire.

Haul routes associated with vegetation treatments may be constructed as temporary roads, or could be added to the transportation system. Effects of those actions would be analyzed through project-specific analysis. In general, effects may include unauthorized use of haul routes, and affects to scenery and the recreation experience may occur. For example, a reduction in a more primitive recreation setting could occur as a result of an increased presence of constructed roads.

Vegetation treatments do not occur in the same general location at the same times. Due to the scale, as well as the dispersed and temporal nature of these projects, the potential for this cumulative effect is negligible under each alternative and the same for all the alternatives.

Wildfire and Fire Suppression Activities

Wildfires create openings in the forest, which can allow unauthorized use to encroach into these areas, if unmanaged. Fire suppression activities may result in temporary closures of roads and trails to provide for public safety. Fire lines, helipads, safety zones and areas where fire camps are located can result in areas of disturbance and cleared vegetation, which may encourage unauthorized OHV use and dispersed camping access where it had not occurred before. Due to the dispersed and temporal nature of these projects, the potential for this cumulative effect is negligible under each alternative and the same for all the alternatives.

Transportation

Existing Condition

Description of transportation system

The transportation system on the Madison Ranger District of the Beaverhead-Deerlodge National Forest is composed primarily of National Forest System roads (NFSRs or "system" roads) and National Forest System trails (NFSTs or "system" trails). Roads under county, state and other federal jurisdictions complement the Forest road system by providing vehicular access to and within the Forest, and by linking the Forest transportation system to highways and communities. Forest roads provide public and administrative access for recreation, resource management, and protection of National Forest System (NFS) lands, as well as access to private in-holdings. The Forest system trails, along with trails managed by other government agencies, provide a network of motorized and non-motorized routes for recreation and administrative access within and adjacent to the Forest.

In addition to the routes described above, there are a number of "unauthorized" roads and trails on the Madison R.D. These routes are on NFS lands but are not system roads or trails, nor are they under the jurisdiction of other government entities, private parties, or permittees. Formerly known as "unclassified" roads and trails, some unauthorized routes may be user-created routes which "evolved" through continued use; others may have been constructed (either legally or illegally) for mining, timber, wood-cutting, temporary access, recreation, or other purposes without being decommissioned after use.

Many roads and trails on the Madison R.D. are currently subject to travel restrictions as to the VT/SOU. These restrictions were implemented based on past travel management decisions. As a result, motorized use is not allowed on unauthorized routes on the District except in an area in the southwest portion of the Tobacco Root range where travel analysis was not conducted previously. The disposition of those unauthorized routes will be considered in the project analysis.

As described above, the Forest transportation system consists of both roads and trails. The current inventory of all routes is displayed in the following section. Since trails primarily serve a recreational purpose, however, the remainder of this report will concentrate on roads. Trail information can be found in the recreation report.

Current road and trail inventory

Mileages for the current inventory of roads and trails on the Madison R.D. are shown in Table 15 below. System roads are broken down by operational maintenance level. All roads and trails are displayed by motorized status (closed year-round or open for wheeled motorized use for at least part of the year).

Table 15. Miles of existing roads and trails by motorized status.

Motorized Status	System Roads		Unauth-orized Roads	Total Roads[1]	System Trails	Unauth-orized Trails	Total Trails[1]	Total Roads & Trails[1]
	Oper. ML	Miles						
Closed to motorized use	1	37.1	210.1	247.2	392.6	67.3	459.9	707.1
Open to motorized use	2	347.4	12.0	624.7	174.3	3.3	177.6	802.3
	3	226.3						
	4	39.0						
	Total ML 2-4	612.7						
Totals 1		649.8	222.1	871.9	567.0	70.6	637.5	1,509.5

1 - The sum of the mileages displayed in each category may not exactly match the totals shown due to rounding errors. All mileages were derived from GIS lengths and rounded separately.

Road operation and maintenance

As discussed in the Beaverhead-Deerlodge Forest-scale Roads Analysis (June 2005), funding for road maintenance has not been sufficient to fully maintain the Forest's roads at the assigned maintenance levels. A significantly reduced timber sale program, which historically generated deferred road maintenance funds and required purchaser maintenance on haul roads, has further reduced maintenance opportunities. Road condition surveys on the Forest over the past few years have revealed a large backlog of deferred maintenance needs.

With limited funding, the Forest concentrates its road maintenance on high priority roads. As reported in road accomplishment reports for the past two fiscal years (FY 2008 and FY 2009), about 20.2% of the total road system received maintenance each year. The average number of miles maintained by operational maintenance level (ML) was fairly consistent in those two years, averaging about 9.5% of the Forest's ML 1 roads, 3.7% of the ML 2 roads, 50.0% of the ML 3 roads, 37.1% of the ML 4 roads, and 6.8% of the ML 5 roads.

Maintenance on ML 1 roads, which are closed under "custodial care", is generally limited to periodic walk-through inspections to insure that no resource damage is occurring. Maintenance level 2 roads, which make up over half the Forest's road system, generally receive infrequent maintenance except where resource issues or damage dictate. These roads are considered suitable only for high clearance vehicles, so very little maintenance is generally required for the sake of "drivability." Nonetheless, additional funding would permit increased maintenance on ML 2 roads to ensure resource protection. Maintenance levels 3 through 5 are considered suitable for passenger vehicles. Maintenance level 3 roads make up just over 30% of the Forest's road system yet receive most of the road maintenance attention. These roads are among the heaviest used on the Forest, so require maintenance to keep them up to standard for drivability and resource protection.

The Madison District contains approximately 14% of the Forest's road system. Road maintenance accomplishments are tracked Forest-wide rather than district-by-district. However, a review of road maintenance records for the Madison District during FY 2008 shows that approximately 194 miles of road received routine road maintenance such as blading, culvert cleaning, and spot surfacing. This is about 30% of the District's total system road mileage. Most of the maintained roads were ML 3 (about 138 miles; 61% of the District's ML 3 roads), followed by ML 4 (about

35 miles; 91% of the District's ML 4 roads) and ML 2 (about 20 miles; 6% of the District's ML 2 roads).

Effects Analysis

Resource Factors to be Analyzed and Units of Measure:

Factors: Average annual road maintenance costs.

Metrics: U.S. Dollars.

Geographic Scope:

Analysis Method/Bases of Analysis: The analysis area for road maintenance is the entire Madison Ranger District, plus "system" roads on adjacent non-NFS lands which provide access to the District.

As described in the first section of this report under existing condition (road operations and maintenance), road maintenance costs are not specifically tracked and reported by ranger district. Thus, this analysis will use only FY 2008 expenses incurred by the Forest Service road crew for routine road maintenance on the Madison R.D. as a basis for unit costs. Unit costs for operational maintenance level 2, 3, & 4 roads during that year are shown in Table 16. Maintenance level 1 inspection costs are not included since those periodic inspections are not typically performed by the road crew. Any overhead costs not related to the maintenance of specific roads are not included either.

Table16. FY 2008 routine road maintenance expenditures by the Forest Service road crew on the Madison R.D.

Oper. ML	Maintenance costs ($)	Miles maintained	Unit cost ($/mi)
2	6,178	20.3	304
3	37,000	138.3	268
4	8,798	35.3	249
Various	4,724	--	--
Totals	$56,700	193.9	--

This analysis is intended solely as a relative comparison between alternatives. It is not intended to represent "absolute" costs. Fixed costs (such as overhead) are not considered, nor are costs for decommissioning or any activity other than routine road maintenance such as grading, culvert cleaning, and spot surfacing.

The alternatives are compared by finding the difference in operational maintenance level 2, 3, and 4 road mileages between the existing condition (Alternative A) and each of the action alternatives (Alternatives B, B Modified, and C). The differences in mileage for each maintenance level are multiplied by the unit costs shown in Table 2. Then, since not all roads are maintained every year, these costs are multiplied by the percentage of roads maintained each year assuming the same ratio of roads that were maintained in FY 2008 on the district: 6% of ML 2 roads, 61% of the ML 3 roads, and 91% of the ML 4 roads. (See the first section of this report under road operation and maintenance for an explanation of these percentages.).

Alternative A - No Action

Direct and Indirect Effects:

There are no direct effects to road maintenance with the "no action" alternative. Road maintenance would continue, as needed, on the same set of roads as in the past. Appropriated funds may not be expended to maintain unauthorized roads. The actual quantity and type of maintenance on system roads would depend on future funding availability.

Road maintenance needs are likely to continue to exceed maintenance accomplishments due to inadequate funding levels.

Cumulative Effects:

The Record of Decision Enacting Forest Plan Travel Management Direction for Certain Areas of the Beaverhead-Deerlodge National Forest (ROD 2) closes 28.3 miles of system roads, including 24.9 miles of maintenance level (ML) 2 roads and 3.4 miles of ML 3 roads. This results in an estimated road maintenance cost savings of $1,010 per year.

Alternative B – Proposed Action

Direct and Indirect Effects:

This alternative would result in a reduction of 109.8 miles of ML 2 roads and a reduction of 2.9 miles of ML 3 roads (112.7 miles total). Estimated road maintenance cost savings would be $2,477 per year compared to present costs ("no action," Alternative A).

Although the number of open system roads would be reduced, most would be ML 2 roads. As noted earlier, only 6% of the ML 2 roads on the Madison Ranger District were maintained during FY 2008. Thus, the large reduction in road miles would not translate to large maintenance cost savings. The actual quantity and type of maintenance on system roads would depend on future funding availability.

Road maintenance needs are likely to continue to exceed maintenance accomplishments due to inadequate funding levels.

Cumulative Effects:

The Record of Decision Enacting Forest Plan Travel Management Direction for Certain Areas of the Beaverhead-Deerlodge National Forest (ROD 2) closes 28.3 miles of system roads, including 24.9 miles of maintenance level (ML) 2 roads and 3.4 miles of ML 3 roads. This results in an estimated road maintenance cost savings of $1,010 per year.

Alternative B Modified

Direct and Indirect Effects:

This alternative would result in a reduction of 99.3 miles of ML 2 roads and a reduction of 0.9 mile of ML 3 roads (100.2 miles total). Estimated road maintenance cost savings would be $1,958 per year compared to present costs ("no action," Alternative A).

Although the number of open system roads would be reduced, most would be ML 2 roads. As noted earlier, only 6% of the ML 2 roads on the Madison Ranger District were maintained during FY 2008. Thus, the large reduction in road miles would not translate to large maintenance cost

savings. The actual quantity and type of maintenance on system roads would depend on future funding availability.

Road maintenance needs are likely to continue to exceed maintenance accomplishments due to inadequate funding levels.

Cumulative Effects:

The Record of Decision Enacting Forest Plan Travel Management Direction for Certain Areas of the Beaverhead-Deerlodge National Forest (ROD 2) closes 28.3 miles of system roads, including 24.9 miles of maintenance level (ML) 2 roads and 3.4 miles of ML 3 roads. This results in an estimated road maintenance cost savings of $1,010 per year.

Alternative C

Direct and Indirect Effects:

There are no direct effects to road maintenance with this alternative since all system roads are the same as in the "no action" alternative (Alternative A). Road maintenance would continue, as needed, on the same set of roads as in the past. Appropriated funds may not be expended to maintain unauthorized roads. The actual quantity and type of maintenance on system roads would depend on future funding availability.

Road maintenance needs are likely to continue to exceed maintenance accomplishments due to inadequate funding levels.

Cumulative Effects:

ROD 2 closes the same 28.3 miles of system roads as in Alternative A. This results in an estimated road maintenance cost savings of $1,010 per year (the same as Alternative A).

Table 17. Comparison of Alternatives

Item of Comparison	No Action (Alternative A)	Proposed Action (Alternative B)	Alternative B Modified	Alternative C
Routine system road maintenance costs	(Baseline costs)	Estimated savings of $2,477 per year	Estimated savings of $1,958 per year	No difference from "no action" (Alternative A)

Social/Economics

Existing Condition

Existing Condition Methods

Economic information used to describe the affected environment was compiled from various government sources; there was no new data collected specifically for this analysis. Existing county-level information has been aggregated for the economic impact area and is used in combination with some national forest-level data to describe trends in the regional economy. County economic profiles are available from the Bureau of Land Management's Economic Profile System (EPS), which compiles and digests primary population and economic data from a variety of government sources into a report. The recent EPS reports, which include data up to 2007, describe the population, employment, and income composition of the counties comprising the economic impact area for this Travel Planning Project. Highlights of the aggregated EPS report are presented below to describe the economy that may be impacted by the Madison Ranger District Travel Plan decision.

Wildland dependency data, based on the percent of total labor income (employee compensation and proprietor (self-employed) income) earned in five resource areas was obtained from Gebert and Odell (2006). In these calculations the portion of labor income earned in all economic sectors that is associated with each of five wildland resource areas was 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.

Travel management economic contribution analysis is also presented to show the existing contribution that various recreation segments from the entire Beaverhead-Deerlodge National Forest, as observed for 12 consecutive months during 2004 and 2005 with the US Forest Service's National Visitor Use Monitoring (NVUM) program, make to the economic impact area. Economic contributions tied to motorized and non-motorized activities were estimated to address the economic impact issues tied directly to travel planning.

Employment and labor income contributions were estimated for all current recreation use (i.e., wildlife and non-wildlife recreation activities) on the entire Beaverhead-Deerlodge National Forest, and were then broken into local versus non-local visitation as well as motorized versus non-motorized activities occurring on the Forest. Expenditure profiles tied to all recreation visitations were estimated to establish the total economic contributions made through recreation activities on the Forest.

Economic contributions can be categorized as direct, indirect, and induced. Direct effects are changes associated with the initial spending by a recreation visitor. Indirect and induced effects are the multiplier or ripple effects resulting from subsequent rounds of spending in the local economy.

Input-output analysis was used to estimate the direct, indirect, and induced employment and labor income effects stemming from motorized and non-motorized use. Input-output analysis is a means of examining relationships within an economy both between businesses as well as between businesses and final consumers. It captures all monetary market transactions for consumption in a given time period. The resulting mathematical representation allows one to examine the current contributions a sector makes to an economic impact area, as well as the effect of a change in one or several economic activities on an entire economy. These examinations are called "economic

contribution analysis" and "economic impact analysis," respectively. Input-output analysis requires the identification of an economic impact area. The economic impact area that surrounds the Beaverhead-Deerlodge National Forest was previously defined, and consists of six counties in southwestern Montana and two in eastern Idaho.

The IMPLAN Pro input-output modeling system and 2007 IMPLAN data (the most recent data available with sectors bridged to NVUM data) were used to develop the input-output model for this analysis (IMPLAN Professional 2003). The IMPLAN data and software translates changes in final demand for goods and services into resulting changes in economic effects, such as labor income and employment for the economic impact area. For the economic impact area, employment and labor income contributions that were attributable to all current recreation use (wildlife and non-wildlife activities) and only motorized and non-motorized activities for the Beaverhead-Deerlodge National Forest were generated.

The expenditure and use information collected by the Calendar Year 2000 and the Fiscal Year 2005 NVUM surveys are crucial elements in the economic analysis. The expenditure information was collected by eight spending categories (Stynes and White 2005). The reported spending for each of the categories was allocated to the appropriate industry within the IMPLAN model (the allocation process, also referred to as "bridging," was conducted by the USDA Forest Service, Planning Analysis Group in Fort Collins, CO). The bridged IMPLAN files were used to estimate economic contributions (e.g., employment and labor income) related to existing spending. Estimated existing Beaverhead-Deerlodge National Forest recreation economic contributions (full and part-time jobs and labor income) are displayed in the following ways: Estimated employment and labor income based on all, local and non-local, recreation visitation occurring on the Beaverhead-Deerlodge National Forest; Estimated employment and labor income by motorized and non-motorized activity types.

Social Issues

This section addresses the existing social conditions for the area potentially affected by the Travel Plan. The key social factors evaluated in this analysis include: lifestyles, land management perspectives, and recreation preferences. The combination of small towns and rural settings, along with people from a wide variety of backgrounds, provide a diverse social environment for the southwestern Montana geographical region. 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 operations; outfitter and guide businesses; hiking; hunting; fishing; camping; skiing; snowmobiling, ATVs, OHV riding, and many other recreational activities.

Tourism, sport fishing, timber harvest and processing, and agricultural industries are all important to the economy of the 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.

Travel management planning and route designation largely involve social issues. Travel planning involves a lot of consideration and a lot of discussion, due to compatible and/or competing uses and the needs to protect resources along with quality recreational experiences. Forest Service roads and trails provide opportunities for all types of activities: motorized and non-motorized, summer uses and winter uses, etc., for local users and for non-local visitors. People may use the roads to drive toward the source of their employment (e.g. mining, forest management, outfitters

and guides, and grazing). People may use the roads to access areas where they can go beyond motorized noises and recreate in quiet places. Others use the roads and trails to recreate and drive on with their motorcycles, ATVs, and snowmobiles. In addition, many people who visit the Beaverhead-Deerlodge National Forest have special attachments to certain activities and to certain places. Consequently, limiting, changing and/or closing their type of access can produce strong reactions. Beaverhead-Deerlodge National Forest personnel made great efforts to understand people's uses, motivations, and tolerance for change, and to consider these in travel planning and management.

People do not necessarily have to be active users of Forest Service System roads and trails in order to hold values regarding access to the national forest, or to benefit from the existence (or non-existence) of the road and trail system. These "passive-use values" are values or benefits people receive from the existence of a specific place, condition, or thing – independent of any intention or expectation of them participating in active use of it. For example, some people believe that forest roads should be kept to a minimum because of negative ecological impacts that are sometimes associated with roads. Others believe that it is important to maintain large tracts of un-roaded land in order to protect roadless and/or wilderness values, leaving a legacy of undeveloped land for future generations to experience. And, some people may not use the Forest Service roads, but believe it is important to maintain that system for things such as timber harvest, mining, fire protection, and tourism.

There is abundant easily-available information describing individual counties as well as the Beaverhead-Deerlodge economic impact area. These can be found in Economic Profile System reports (http://www.headwaterseconomics.org/eps/) as well as Chapter 3 of the Final Economic Impact Statement prepared to support the revised Beaverhead-Deerlodge National Forest Plan: ttp://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5052782.pdf. 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. In aggregate, from 1970 to 2006, the population of these eight counties fell by 5,340 people from 88,308 to 82,968, decreasing by 6% in the 36 year period. The majority of this decrease occurred mainly from the mid 1970s through the early 1990s. It reached its low during this period in 1990 at 79,057 people. The population recovered to roughly 84,897 people during 1998 before falling again. In sum, these eight counties had a year 2000 population of 84,520. There were 5,463 additional residents or roughly 6.9% growth since 1990. The population the eight-county area also got older since 1990, where the median age was up roughly 4 years, from 36 years in 1990 to 40 years in 2000. That year, the largest age category was 40 to 44 year olds (7,276 people or 8.6% of the total). The age group that grew the fastest, as a share of the total, was 45 to 49, up 2,462 people that decade; their share of the total rose by 2.5%. The 2000 population density in the eight-county area was 4.8 people/square mile (BEA REIS 2006, 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 eight counties. 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 employed 63% or the greatest portion of workers across the eight-county area

during 2000. Producing goods provided 15% of all jobs. Government employment at 17% was also high across the economic impact area during 2000.

In aggregate, over the period 1970 to 2006, growth of 15,866 jobs occurred in the eight-county area, representing an increase of 45.5% or an average annual rate of 1.3%. This was substantially slower than the state and the nation, which makes sense given the decrease in population during this 36-year period. From 1970 to 2000, the majority of job growth, 59% of new jobs, was in proprietors (self-employed). For wage and salary employment, the category whose share of the total employment gained the most was Services and Professional, which went from 51.2% in 1977 to 60.3% in 2000. In 1977, proprietors represented 19.7% of total employment; by 2000, they represented 29% of all jobs (BEA REIS 2006). Government employment across the economic impact area decreased as a portion of total from 22.3% during 1977 to 17.3% during 2000. After losing 555 jobs during the 33 years, Manufacturing (including forest products) also declined as a portion of total, from 7.9% (2,823 jobs) to 5% (2,268 jobs) during 2000. Mining also lost 800 jobs from 2,370 down to 1,570 by 2000. Farm employment decreased between 1977 and 2000, down from 7.1% to 6.5%.

Wage and salary employment contributed 49.3% of new employment between 1995 and 2006. The growth in both the number of operating firms by sector and the jobs by sector suggest that wage earners in the Services, Retail, and Construction sectors explain much of the job growth in the eight-county area. Most firms operating in the eight-county area are small in size. During 2005, the size category that had the greatest number of firms was 1-4 employees. The 5-9 employees firms were the category that grew the most between 1977 and 2005. In 2004, 92% of firms had fewer than 20 employees. Eight of the nine largest four firms in the eight-county area had 250-499 employees, the largest had between 500-999 (Census County Business Patterns).

In 2007, the unemployment rate was 3.2%, compared to 3.1% (state) and 4.6% (nationally) The monthly unemployment rate more than doubled from a low of 2.4% in September 2007 to a high of 4.4% in January 2007 (Local Area Unemployment Statistics, Bureau of Labor Statistics).

Income

Total personal income (TPI) and per capita personal income (PCPI) are often used to proxy standard of living. Although PCPI for the economic impact area 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 higher costs associated with living in metro areas which comprise a large portion of the national average. The economic impact area saw an increase in the portion of income from non-labor sources (dividends, interest, and rent as well as transfer payments from governments to individuals including Medicare, welfare, disability insurance payments, and retirements) but simultaneous decreases in average earnings per job. Goods producing jobs continue to pay more than service providing jobs in general, however, Federal and state jobs often only a small portion of the workforce for a county, lead in pay per job.

From 1970 to 2006, annual personal income for the economic impact area increased $1.035 billion in real ($2006) terms. The average annual real growth rate of 1.9% was slower than both the state and national rates. The income category whose share of the total gained the most was non-labor income, which went from 28% in 1970 to 42% in 2006, with even higher percentages than this between the early 1980s and the late 1990s. In those 36 years, non-labor sources grew at an average annual rate of 2.4%, outpacing labor sources which grew at a 1.0% rate. Of the new income in that period, 53.9% was from non-labor sources. In 2006, 64% of transfer payments were from age-related sources (retirement, disability, insurance payments, and Medicare). That year, welfare represented 6.8% of transfer payments and 1.3% of total personal income. This was up slightly from 1970 and down slightly from 1980 (BEA REIS 2006 Table CA35). Per capita

personal income (PCPI), adjusted for inflation, rose from $16,868 in 1970 to $30,432 in 2006. After this 80.4% growth during the 36-year period, the 2006 PCPI in the economic impact area ($30,432) was slightly lower than the state ($30,790) and lower than the nation ($36,714).

Average earnings per job, adjusted for inflation, fell from $33,047 in 1970 to $31,585 in 2006. In 2006, average earnings per job in the economic impact area at $31,585 were lower than the state ($32,764) and substantially lower than the nation ($47,286). During the 36-year period, average wage and salary disbursements fell at an average annual rate of -0.2% (adjusted for inflation), whereas average non-farm proprietors' income fell annually by -0.4%.

In general, despite the negative population growth, the economic impact area profiled in this analysis appears fairly healthy with long term increases in employment and real personal income, and substantial increases in per capita personal income during the period from 1970 to 2005. Average earnings per job have fallen for the economic impact area, but labor income has become a smaller part of total personal income. All counties have winter unemployment rates roughly twice that of the annual low, occurring in September and October.

Change is a constant in many geographic areas, especially those dependent on natural resources. Undulations in both the labor income and the growing portion of non-labor income may generate some instability for many of the economic indicators used to proxy economic well-being. The influence of the global economic recession will be difficult to predict and detect in some of these variables. Trends, like growth in service-sector employment and income found in these counties, are shared by most peer counties across the Rocky Mountain west. These growth trends are largely driven by population growth of both permanent and seasonal residents, and the changes in travel management in the Beaverhead-Deerlodge National Forest area is unlikely to have a noticeable impact on these economic indicators.

Economic Diversity and Natural Resource Dependency

One measure of economic success and resilience is economic diversity, or the lack of overspecialization. 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. For this index, the number of employees in each two-digit industry is first divided by the total number of employees in the county. This fraction is then squared for the given industry. Results for all industries in the county are then summed. This means that the more even the distribution of employees across all possible industries, the smaller the score; small scores imply greater diversity and large scores imply specialization.

Collectively, these eight counties scored 167. In general, the economic impact area is over reliant on agriculture, forestry, fishing and hunting (7.7% compared to 1.5% in the US), public administration (7.7% compared to 4.8% in the US), and accommodation and food services (8.8% compared to 6.1% in the US), but under reliant on manufacturing (5.0% compared to 14.1% in the US).

Wildland dependency data (Gebert and Odell 2006) for 2000, based on the percentage of total labor income (employee compensation and proprietor income) earned in five wildland resource areas (timber, mining, grazing, recreation and wildlife, and federal wildland-related employment), is available in Table 18 below for the eight economic impact area counties. The portion of labor income earned in economic sectors associated with each resource area was calculated for 1993 and 2003, as was the change over the decade. As the economies in the communities in each county have grown, and labor income has increased in general, some wildland industries have grown and others have shrunk relative to the larger county-wide labor income picture. Although

these numbers cannot support thorough trend analysis, as they are only two snapshots in time and fit into the larger dynamic economy, they do provide some important information.

Table 18. Labor Income Wildland Dependency Percentages by Resource for 2003 and Change between 1993 and 2003.

County	Grazing	Timber	Mining	Federal Wildland Government	Recreation and Wildlife	Primary	Indirect	Total
Anaconda-Deer Lodge Co.	0.67	0.09	1.75	2.15	0.00	4.66	3.68	8.35
Change 1993-2003	-0.40	-0.07	+0.97	-0.46	0.00	+0.04	+1.69	+1.74
Beaverhead Co.	3.25	0.59	9.63	5.35	7.73	26.54	12.36	38.90
Change 1993-2003*	-6.70	-1.36	+2.67	-0.79	+6.81	+0.62	-21.19	-20.57
Broadwater Co.	2.13	19.94	5.25	2.35	4.18	33.85	25.58	59.43
Change 1993-2003	-6.21	+5.69	+3.68	-0.07	-1.24	+1.86	+4.03	+5.88
Butte-Silver Bow Co.	0.17	0.07	5.86	0.81	0.00	6.91	3.61	10.52
Change 1993-2003	-0.15	+0.04	-1.84	-0.28	0.00	-2.24	-8.57	-10.81
Granite	2.74	12.73	3.19	2.77	7.89	29.33	16.88	46.21
Change 1993-2003	-6.43	-15.00	-0.96	-1.40	-0.83	-24.63	-9.90	-34.52
Jefferson Co.	1.45	1.14	13.8	1.05	2.63	20.07	26.75	46.82
Change 1993-2003	-2.07	+0.56	-8.68	+0.17	-1.47	-11.5	+9.15	-2.34
Madison Co.	4.06	0.44	1.90	2.21	12.47	21.09	15.97	37.06

County	Grazing	Timber	Mining	Federal Wildland Government	Recreation and Wildlife	Primary	Indirect	Total
Change 1993-2003*	-4.72	-3.14	-12.18	-0.78	+2.62	-11.11	-18.73	-29.84
Powell Co.	2.27	15.25	0.71	1.73	5.5	25.47	17.97	43.44
Change 1993-2003	-2.04	+4.59	+0.53	+0.07	-0.94	+2.21	+6.71	+8.92

(Source: Gebert and Odell, 2006). * Because of data problems for Beaverhead and Madison Counties, original 1993 and original 2003 were used for change calculations. These differences from other counties were revised 1993 estimates and original 2003 estimates were used for calculations.

Southwestern Montana is a heavily wildland dependent part of the nation. Changes in wildland dependency between 1993 and 2003 varied substantially for the eight counties in the Beaverhead Deerlodge National Forest economic impact area; with five counties becoming less wildland dependent and three counties becoming more wildland dependent that decade. The most wildland dependent County of the group during 1993 was Granite County, which earned roughly 81% of all labor income in direct wildland income and indirect and induced supporting sectors. This was followed by Madison County (66.9%), Beaverhead County (59.5%) Broadwater County (53.55%), Jefferson County (49.2%), Powell County (34.5%), Butte-Silver Bow County (21.33) and Anaconda-Deer Lodge County (6.6%) By 2003 the picture had changed, and Broadwater County emerged as not only the most wildland dependent county in the economic impact area, but with 59.47% of all labor income associated with these wildland sectors (directly or through multiplier effects), it was the most wildland dependent county in Montana that year. Jefferson (48.8%) and Granite (46.2%) counties earned just shy of half of all labor income from wildland associated work, whereas, Powell (43.4%), Beaverhead (38.9%), Madison (37.1%) earned somewhat smaller portions, and the two most urban counties, Butte-Silver Bow (10.52%) and Anaconda-Deer Lodge (8.35%) counties showed less labor income dependence on wildlands.

Without exception all counties saw a decrease in the dependence on the grazing industry, with Beaverhead, Granite and Broadwater Counties all decreasing direct dependence by roughly 6%. Granite County saw its dependence on the timber industry more than cut in half. On the other hand, Broadwater and Powell counties' share of labor income from timber related earnings increased by roughly 5%. Mining became a smaller portion of total labor income earnings in Madison, Jefferson, Butte-Silver Bow and Granite counties, but became a larger portion of labor income in the other counties. Wildland related Federal government labor income fell as a percentage of the total in all but Jefferson and Powell counties, where it increased very slightly. The 2003 recreation and wildlife related labor income was highest in Madison County at 12.5%. Granite (7.9%) and Beaverhead (7.7%) counties also had substantial portions of direct labor income earnings in recreation and wildlife related sectors. Beaverhead had increased to this level whereas Granite County had decreased to this level. Madison County was the only other county that saw an increase in the percent of labor income earned in this sector the other five counties saw reductions of roughly 1% between 1993 and 2003.

The Western US OHV User Community

A recent report estimated that national participation rates in OHV activities may have peaked during 2003, and that US residents over 16 years of age averaged roughly 28 days per year of motorized recreation between 2005 and 2007. In Montana, between 1999 and 2007, an estimated 28.7% of residents 16 years and older (the 95 % confidence interval was 25.2-32.2%) participated in OHV recreation. This ranked Montana residents 6th among all states for the participation rate, and amounted to approximately 219,000 participants, who collectively represent roughly half of one percent of all US participants (Cordell et al 2008). Cordell et al. (2008) described some OHV user demographics by region: "The West had the highest OHV participation rate (28%) of all the regions especially among young people where more than 40% under age 30 were OHV users. This was more than two-and-a-half times the rate of people over age 50 (15%). Males living in the West were more likely to participate just as in the other regions, but in this region, the female rate of 23% was considerably higher than the female rate in other regions. American Indians (32%) and Whites (31%) led participation among racial and ethnic groups, but Hispanics in the West (24%) participated at a much higher rate than Hispanics in the two eastern regions and also at a rate higher than the Midwest Hispanic rate. All but the lowest income category participated at 20% or higher. People in all income groups between $25,000 and $150,000 participated at more than a 30% rate. Similarly, all education classes, except post-graduates, participated at more than 25%. Still, post-graduates in the West participated at considerably higher rates than their counterparts elsewhere in the country. More than

one in three non-metropolitan residents participated in OHV recreation as compared with about one in four metropolitan residents saying they participated in OHV recreation." (Cordell et al. 2008, p. 29).

"Interestingly, the West, which led all regions with 28% of people 16 and older participating, had the next-to-smallest average annual days of OHV use with 23.2 days for participants, ahead of only the Pacific. Differences by age group were slight, but the highest average was for the 51 years and older age group. That was not true for either of the eastern regions or the Midwest. Male activity days were about six days higher than for females, however, data were not sufficient to estimate days by all income classes. High school graduates (26.1) and people with bachelor's degrees (23.7) led other educational attainment groups by a slender margin. Another interesting result for this region is the large difference in average days by non-metropolitan residents (35.3) compared to metropolitan dwellers (19.1). This is probably an indication of the convenient and ready access to OHV opportunities on public land in the rural West." (Cordell et al. 2008, p. 36).

Recreational National Forest Use, Social Issues, and Conflict

Social issues and impacts regarding management activities on National Forest System lands are often addressed according to the potential effects that Forest Service management may have on local, county, and regional social and economic systems, and also on the people using and valuing the resources and opportunities the National Forests provides. People use the Beaverhead-Deerlodge National Forest for a variety of reasons.

Strong preferences for specific recreation settings are leading to competition for the recreational resources available (English et al. 1999). The combination of increased use, diversified uses, and attachment to certain places combined with the need to provide for healthy and sustainable environments, along with limited road and trail maintenance budgets, makes for a challenging balancing act.

Social issues concerning travel planning on the Beaverhead-Deerlodge National Forest have much to do with the variety of uses and allocations, and the values people hold toward those uses, allocations, and places and the potential conflicts between these uses and underlying values. People are concerned about the effects to wilderness characteristics, and also law enforcement, safety, and natural resource conditions (particularly in riparian areas). Some conflict does exist between different types of users, mainly between motorized versus non-motorized, hunting and fishing versus non-consumptive uses, local recreational uses versus tourism, and resource preservation versus resource extraction. Another issue raised by forest users locally and nationally is the concern that with an aging population, that road's perhaps not be decommissioned so that they can be walked on and/or that motorized opportunities remain open for older and/or disabled persons to access. For the Beaverhead-Deerlodge National Forest, the main issue concerns motorized and non-motorized uses, and the conflicts which can and often do arise between these uses.

The conflict between motorized and non-motorized use is somewhat self-explanatory: motorized users (including snowmobiles, OHV's, and motorcycles) like to travel the land on their motorized vehicles. Non-motorized users (including hikers, bicyclists, backpackers, wildlife viewers, stock users, and cross-country skiers) value the "natural experience," one which does not include noise and the intrusion of machines. Both groups tend to value their uses for similar reasons, and often desire the same types of settings and experiences. People like to use the forest with their friends and family; they appreciate activities out-of-doors; they appreciate the beauty of the area; the challenges presented. Both groups usually seek destinations, scenery, loop trails, and/or roads.

Montana Trends in Motorized Use

Figure 1 shows the trend in the number of registered ATVs, snowmobiles, and motorcycles (street and dirt bikes) in Montana for the period 1992-2004 (MT Dept. of Justice 2005). This information is useful in gauging the popularity of outdoor activities that use this equipment since trend information is difficult to obtain for these types of dispersed activities. In general, the data indicate an upward trend in ownership in Montana. The average annual growth rates for ATVs, snowmobiles, and motorcycles from 1992-2004 were 9.7%, 5.4%, and 7.3%, respectively. This compares to an average annual population growth rate in Montana of approximately 1% (but roughly 6.3% average annual population growth in the economic impact area) during this time period. The registration growth trend continued during 2005 and 2006 for both OHV's and snowmobiles according to recent data from the Montana Department of Justice Title and Registration Bureau. The growth rate in registration far exceeded the state population growth rate, and was in step with the economic impact area population growth rate, indicating that either those activities that use this motorized equipment are gaining popularity and/or compliance with registration requirements has increased.

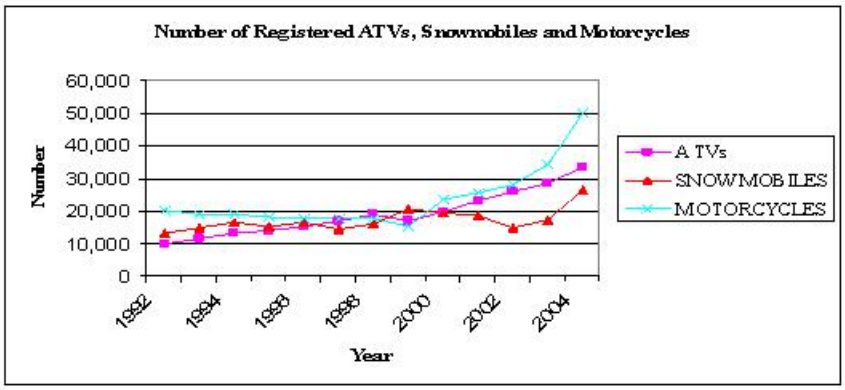

Figure 1. Registered All Terrain Vehicles, Snowmobiles, and Motorcycles in Montana 1992-2004

National Visitor Use Monitoring (NVUM)

The NSRE research described above estimates recreation occurring statewide on all land ownerships. One of the issues raised through comments during travel planning is the economic contributions (i.e., economic impacts) of motorized and non-motorized uses. Various sources of information are used to display use and trends in motorized and non-motorized use in Montana and on the Beaverhead-Deerlodge National Forest. Vehicle registration data from the Montana Department of Revenue was used to understand the county, economic impact area and state-wide trends in snowmobiles, ATVs, and motorcycles. Results from a statistically rigorous sampling regime used by the Forest Service, called the National Visitor Use Monitoring survey (NVUM) are displayed to describe total Beaverhead-Deerlodge National Forest use (visits) and this use is apportioned as various motorized and non-motorized activities.

The NVUM survey was implemented to better understand recreation use occurring on National Forest System lands (Kocis et al. 2003). The National Visitor Use Monitoring (NVUM), a statistically valid recreation study conducted by the Forest Service, estimated participation rates and spending for various activities specifically on the Beaverhead-Deerlodge National Forest. From October 2004 through September 2005, the Beaverhead-Deerlodge National Forest participated in the second round NVUM survey process. Examples of information provided in the Beaverhead-Deerlodge National Forest report include: 1) total number of visits; 2) overall and main activity participation rates; and 3) user satisfaction. The survey also collected information regarding user party spending within approximately 50 driving miles of the National Forest boundary. Users reported expenditures for

various spending categories, such as groceries, restaurants, gas/oil, and lodging. The specific spending profiles and expenditures are found in Stynes and White (2005). Note these spending profiles do not include any durable goods that are used for multiple recreation experiences. For example, hiking boots or ATV purchases are not included in spending profiles since these items are retained after the visit to the national forest. This is consistent with contribution analysis and impact analysis theory.

The NVUM results indicate that a range of 2,225 to 3,331 average daily visits occurred on the Beaverhead-Deerlodge National Forest during the survey period. Table 3 presents participation rates by activity. The column titled Total Activity Participation % presents the overall participation rates by activity. Participation rates greatly exceed 100% since visitors can participate in multiple activities during a given visit. Viewing wildlife (65.5%), viewing natural features (57.7%), hiking and walking (51.9%), driving for pleasure (48.5%), and relaxing (41.8%) led all activities in percent participation. For participation in additional categories of motorized activities, motorized trail activity (15.1%) had highest participation, followed by OHV use (5.7%), motorized water travel (5.5%), and snowmobiling (1.6%). Several of these popular uses can conflict with each other. For instance, hikers may prefer not to hear the noises associated with motorized vehicles, and horseback riders can have conflict with hikers, dogs, and motorized vehicles.

There are several notable special use permits on the Madison District that help contribute to these recreation numbers. There is a resort at Elk Lake that features fishing, outdoor activities and relaxation with lodging and boat rentals. Wade Lake Resort has cabin lodging and non-motorized boat rentals, and the West Fork Cabin Camp (lodging, trailer hook-ups, and camping). There is also a scenic automobile tour permit which mainly supports driving for pleasure, viewing natural features, and viewing wildlife.

In Table 14 below, the Percent as Main Activity column presents the participation rates in terms of visitors' self-selected main or primary activity. The column indicates that the ten most popular primary activities were: 1) hunting (26.7%), 2) viewing natural features (18.7%); 3) fishing (14.1); 4) hiking / walking (8.0%); 5) driving for pleasure (7.9%); 6) gathering forest products (5.5%); 7) cross-country skiing (5.3%); 8) relaxing (4.8%); 9) viewing wildlife, birds, and fish (4.5%); and, 10) picnicking (3.6%).

Table 19. National Visitor Use Monitoring Results, Beaverhead-Deerlodge National Forest FY 2006

Activity	Activity Emphasis for Road & Trail Use	Total Activity Participation (%)1/2	Percent as Main Activity (%)3/4
Snowmobiling	Motorized	1.6	1.5
Driving for Pleasure	Motorized	48.5	7.9
OHV Use	Motorized	5.7	0.1
Motorized Trail & Other Activity	Motorized	15.1	2.6
Motorized Subtotal			12.1
Hiking / Walking	Non-motorized	51.9	8.0
Bicycling	Non-motorized	3.2	1.1
Other Non-motorized	Non-motorized	7.3	0.1
Cross-country Skiing	Non-motorized	5.4	5.3
Backpacking	Non-motorized	1.0	0.6
Horseback Riding	Non-motorized	1.7	0.0
Non-motorized Subtotal			15.1
Downhill Skiing	Other	2.8	2.5

Activity	Activity Emphasis for Road & Trail Use	Total Activity Participation (%)1/2	Percent as Main Activity (%)3/4
Fishing	Other	21.5	14.1
Viewing Natural Features	Other	57.7	18.7
Relaxing	Other	41.8	4.8
Motorized Water Activities	Other	5.5	0.2
Hunting	Other	31.2	26.7
Non-motorized Water	Other	8.6	1.3
Developed Camping	Other	10.1	2.0
Primitive Camping	Other	4.0	0.0
Picnicking	Other	10.8	3.6
Viewing Wildlife	Other	65.5	4.5
Some Other Activity	Other	3.3	2.5
No Activity Reported	Other	0.0	0.0
Resort Use	Other	2.5	1.0
Visiting Historic Sites	Other	11.2	0.4
Nature Study	Other	12.3	0.2
Gathering Forest Products	Other	7.6	5.5
Nature Center Activities	Other	1.0	0.0
Other Subtotal			88.0
Total			115.2

1 – Survey respondents could select activities so this column may total more than 100%.

2 – The number in this column is the percent of survey respondents who indicated participation in this activity.

3 - Survey respondents were asked to select just one of their activities as their main reason for the forest visit. Some respondents selected more than one, so this column may total more than 100%.

4 - The number in this column is the percent of survey respondents who indicated this activity was their main activity.

5 - The 2007/2008 category of "motorized trail activity" was added to OHV use for this analysis.

The primary activity participation rates (Percent as Main Activity) were used to estimate use by activity. For this analysis, motorized and non-motorized uses were defined as follows: 1) motorized = OHV use (which includes motorized trail activity), snowmobiling, driving for pleasure, and other motorized activities, and 2) non-motorized = backpacking, hiking / walking, horseback riding, bicycling, cross-country skiing, and other non-motorized activities. As aggregates, visitors listing motorized use as the primary activity represented 12.1% of the visiting population; visitors listing non-motorized use as the main activity represented 15.1% of the visiting population. It is also notable that 64.2% of all Beaverhead-Deerlodge National Forest visitors listed nature and wildlife related recreation (viewing wildlife, birds, and fish, fishing, hunting, and nature study, visiting nature centers, and viewing natural features) as their primary activity.

Effects Analysis

Visitors are determined to be either local or non-local based on the miles from the visitor's residence to the Forest boundary. If the user reported living within 50 miles of the boundary, they are considered local; if over 50 miles, they are considered non-local. The split between local and non-local primary Beaverhead-Deerlodge National Forest visitors was (50.8%) local and slightly fewer non-local visitors (49.2%). Based on economic surveys conducted as part of NVUM, visitors to the Beaverhead-Deerlodge National Forest are considered average spending visitors compared with peers at all national forests across the country.

Table 20 indicates the number of party trips and the expenditures (2008$ per party trip) for the different motorized and non-motorized activities occurring on the Beaverhead-Deerlodge National Forest. Note that the number of visits (or people visiting in each group) varies by activity. Each activity group has a unique number of visits per party trip. Calendar year 2000 NVUM data is used for some of this analysis since fiscal year 2006 data with this level of detail is not yet available.

Table 20 Number of Party Trips and Expenditures by Activity Type used for Travel Management Economic Contribution Analysis

Activity	Use (Party Trips)1		Expenditures (2008$ per Party Trip)2	
Non-motorized	Local Day (Overnight)	Non-local Day (Overnight)	Local Day (Overnight)	Non-local Day (Overnight)
Horseback Riding 3	0 (0)	0 (0)	20 (87)	37 (246)
Backpacking	NA (1,036)	NA (955)	NA (94)	NA (105)
Hiking / Walking 3	24,648 (1,921)	2,683 (5,205)	20 (87)	37 (246)
Bicycling 3	3,389 (264)	369 (716)	20 (87)	37 (246)
Cross-country Skiing	10,954 (811)	1,666 (5,165)	34 (201)	53 (335)
Other non-motorized 3	308 (24)	34 (65)	20 (87)	37 (246)
Motorized				
OHV 4	211 (62)	46(81)	38 (97)	60 (162)
Driving for Pleasure	27,431 (948)	1,987 (2,407)	24 (94)	37 (173)
Snowmobiling	3,272 (613)	420 (687)	68 (193)	108 (322)
Motorized Trail 4	5,493 (1,602)	1,199 (2,106)	38 (97)	60 (162)

1. Beaverhead-Deerlodge National Forest, National Visitor Use Monitoring Results, September 2006.
2. Stynes Daniel J.; White Eric M. 2005. Spending Profiles for National Forest Recreation Visitors by Activity.
3. These activities share the same spending profile.
4. These activities share the same spending profile.

Of the non-motorized activities, cross-country skier parties spend the most per party trip (ranging from $34 for local day use parties to $201 for non-local overnight use parties). The use data indicates that 10,954 local day and 811 local overnight party trips/year of cross country skiing occur annually on the Beaverhead-Deerlodge National Forest. The majority of non-motorized use is for hiking/walking (24,648 local days, 1,921 local overnight party trips) by local visitors who spend roughly $20 per party trip for day use and $87 per party trip for overnight use.
From the standpoint of motorized activities, snowmobilers spend the most per visit (ranging from $68 for local day use party trips to $322 for non-local overnight part trips). There were 1.5% of primary Beaverhead-Deerlodge National Forest visitors list snowmobiling as their main activity. The 2005 use data also indicates that Driving for pleasure had 7.9% of primary visitors listing it as their main activity and this is associated with the greatest number of summer party trips (32,773). Motorized trail activity had 2.6% of all primary national forest visitors listing it as their main activity. There were also 0.1% of surveyed people who specifically listed OHV use as their main use. Together these two groups of visitors took 10,800 party trips to the Beaverhead-Deerlodge National Forest during 2005.

Table 21 displays the estimated employment and labor income contributions for all recreation visitations (i.e. wildlife and non-wildlife visitation) to the Beaverhead-Deerlodge National Forest. There were a total of 1,014,100 visits to the Beaverhead-Deerlodge National Forest during the FY2005 sampling period (Note: The number of primary visits is slightly less than the total visits reported in the NVUM report). Non-primary visitation to the Beaverhead-Deerlodge National Forest

was eliminated from the economic effects analysis since these users were not coming primarily to recreate on the Forest. The 2000 Beaverhead-Deerlodge NVUM data describing party sizes, and segment portions (local day use, local overnight, non-local day use, non-local overnight) were the most recent available. So these estimates and Round 1 average spending expenditure profiles were applied with the more recent fiscal year 2005 participation data to estimate the current economic contributions. All dollar estimates are provided in 2008 currency.

The results indicate that there were roughly 224 total jobs (direct plus multiplier effect) and $4.28 million of total labor income (direct plus multiplier effect) attributable to the total (non-wildlife plus wildlife) recreation that year. Of this, there were roughly 114 total jobs (direct plus multiplier effect) and $2.15 million of total labor income (direct plus multiplier effect) attributable to local visitation. There were also approximately 110 total jobs (direct plus multiplier effect) and $2.13 million of total labor income (direct plus multiplier effect) attributable to non-local recreation users. It is important to remember that these are our best estimates for the entire Beaverhead-Deerlodge National Forest, and that the visitation numbers and associated economic contributions shown here include the portion that occurs on the Madison District. By acreage, the Madison District represents roughly 20% of the Beaverhead Deerlodge National Forest, and a substantial portion of the district is wilderness with limited backpacking, hiking and horseback access only.

Table 21. Estimated Employment and Labor Income Effects for All Current Recreation Use Reported by NVUM

Economic Effects Based on Local Use (311,650 party trips)			
	Direct Effects	Indirect & Induced Effects	Total Effects
Jobs	90	25	114
Labor Income (M $)	$1,474,723	$677,238	$2,151,961
Economic Effects Based on Non-local Use (126,772 part trips)			
	Direct Effects	Indirect & Induced Effects	Total Effects
Jobs	86	24	110
Labor Income (M $)	$1,475,461	$652,771	$2,128,232

Note: Labor Income is reported in $2009. Totals reflect decimals rounded in this table

In the eight-county economic area, the total employment in 2007 was 50,810 jobs with $2.572 billion dollars in labor income (IMPLAN 2007). Therefore, all employment and labor income attributable to recreation activities on the Beaverhead-Deerlodge National Forest accounted for 0.45% of the total employment and 0.26% of total labor income in the five-county economic impact area.

Motorized and Non-motorized Use

Table 22 displays the estimated employment and labor income effects for current use levels reported by NVUM for local and non-local motorized and non-motorized activities. In general, the estimated economic contributions are a function of the number of visits and the dollars spent by the visitors. For example, non-local users typically spend more money per visit than local users. Also, activities that draw more visitors will be responsible for more economic activity in comparison to activities that draw fewer visitors, holding constant spending per visit.

Table 22. Employment and Labor Income Contributions by Activity Type

Activity	Employment Effects (full & part-time jobs)		Labor Income Effects ($)	
Non-motorized Use	Direct	Indirect & Induced	Direct	Indirect & Induced
Local Horseback Riding	0.00	0.00	0	0
Non-local Horseback Riding	0.00	0.00	0	0
Local Backpacking	0.52	0.16	8771	4,150
Non-local Backpacking	0.53	0.15	9910	4,063
Local Hiking / Walking	3.06	0.84	50,458	23,216
Non-local Hiking / Walking	4.84	1.36	91,926	37,125
Local Bicycling	0.42	0.12	6,938	3,192
Non-local Bicycling	0.67	0.19	12,640	5,105
Local Cross-country Skiing	1.91	0.55	32,429	14,880
Non-local Cross-country Skiing	4.84	1.36	89,596	37,146
Local Other Non-motorized	0.04	0.01	631	290
Non-local Other Non-motorized	0.06	0.02	1,149	464
Total	16.89	4.76	304,447	129,632
Motorized Use				
Local OHV	0.07	0.02	1,106	523
Non-local OHV	0.07	0.02	1,218	574
Local Driving for Pleasure	3.50	0.91	55,279	25,979
Non-local Driving for Pleasure	1.56	0.42	29,965	11,734
Local Snowmobiling	1.44	0.38	23,182	10,723
Non-local Snowmobiling	0.75	0.20	11,970	5,598
Local Other Motorized Act.	1.79	0.49	28,757	13,605
Non-local Other Motorized Act.	1.94	0.55	31,666	14,936
Total	11.12	2.99	180,143	83,672

Note: Dollars are for 2008$

Table 22 indicates that approximately 17 direct and 22 total jobs (direct, indirect, and induced) and $434,079 in total labor income was attributable to non-motorized activities on the Beaverhead-Deerlodge National Forest, with about 35% due to local users and 65% to non-local users. Hiking/walking and cross-country skiing were the non-motorized activities with the strongest economic contribution, together producing (87%) of all non-motorized jobs.

Motorized activities were responsible for approximately 11 direct 14 total jobs (direct, indirect, and induced) and $263,815 in total labor income (direct, indirect, and induced), with 61% of these jobs and income associated with local use. Driving for pleasure on national forests accounted for approximately 6-7 total jobs and $119,957 in total labor income (45.5% of the motorized total). Off-highway vehicle use combined with motorized trail activity, and other motorized activities on the national forest accounted for approximately 5 total jobs and $92,396 in total labor income (35% of the

motorized totals). Snowmobile use on the Forest accounted for approximately 2-3 total jobs and $51,473 total labor income (19.5% of the motorized totals).

Together, this subset of all activities grouped as either motorized or non-motorized accounted for approximately 16% of the jobs and income associated with all recreational activity on the Beaverhead-Deerlodge National Forest, with motorized activities accounting for around 6% and non-motorized activities accounting for 10%.

Beaverhead-Deerlodge National Forest Budget Trend

Table 23 displays the budget for the Beaverhead-Deerlodge National Forest from 2002 through 2006 (Beaverhead-Deerlodge National Forest 2006). The budgets consists Year to Date funding received by September 30 of each year and include agreements, trust and permanent funds, midyear, carryover, and other special project funding but do not include Resource Advisory Committee Funding or Cost Pool funding. The data indicates that the budget declined strongly over the period since 2005. The inflation adjusted budget declined during 2006, and 2007 but then climbed for 2008 and 2009. The change between 2005 and 2009 was negative 12%. This budget decline restricts the Forest's use of appropriated funds to accomplish needed work on the Forest. Forest stewardship contracting, a toolkit frequently applied on the Beaverhead-Deerlodge, allows the Forest to retain receipts from vegetation projects. The retained receipts can be used for vegetation management treatments and required design criteria and other non-timber activities such as road and trail work. However, the amount of work that can be accomplished is also being cut with personnel reductions.

Table 23. Total Beaverhead-Deerlodge National Forest Budget in Non-inflation Adjusted and Real Dollars by Year

Year	Fiscal Year Budget * (Not adjusted for inflation)	Inflation Adjusted Budget ($2009)	Percent Change on Previous Year (inflation adjusted)
2005	$19,500,000	$21,519,436	
2006	$15,800,000	$17,088,807	-20.6%
2007	$14,400,000	$14,878,269	-12.9%
2008	$16,000,000	$16,166,829	+8.7%
2009	$19,000,000	$19,000,000	+17.5%

* These amounts include agreements, trust and permanent funds, midyear, carryover, and other special project funding, but do not include RAC or cost pool funding.

Table 24 shows the part of the Beaverhead-Deerlodge National Forest budget currently allocated for trail maintenance and improvement. In addition to these sources of funding there is abundant work done through volunteer programs

Table 24. Estimates for Annual Beaverhead-Deerlodge National Forest Trail and Road Maintenance Cost by Category

Funding Category	Annual Range FY 2005-2009 ($2009)
Trail Management Capital Improvement Program	$2,546,000
Trail Management Operations and Maintenance	$2,477,000

Economic/Social Analysis Methodology and Scientific Accuracy

This section describes the methods used to understand the existing economy of the Analysis Area (subsequently referred to as the "economic impact area"), as well as the potential economic impacts from the Travel Planning Project decision. The economic impact area is first described. Then methods to describe the affected environment are summarized. This includes wildland dependency information, data from the most recent national survey on recreation and the environment, and a travel management economic contribution analysis based on Forest Service National Visitor Use Monitoring data.

Economic impact analysis area

The economic impact area used for travel planning is Anaconda-Deer Lodge, Beaverhead, Broadwater, Butte-Silver Bow, Granite, Jefferson, Madison and Powell counties in Montana. There are several other counties whose residents recreate on the B-DNF, including Gallatin, Lewis and Clark, Missoula, and Ravalli counties in Montana, as well as Clark, Fremont, and Lemhi Counties in Idaho. However, the core counties used in the Forest Plan economic analysis are also used here. Access management activities within the Project Area have the potential to mainly impact the economic conditions of the communities in these counties. Seven of the eight counties are displayed in Figure 2. The exception is Broadwater County located northeast of the Madison Unit, east of Jefferson County. The Analysis Area for the social resource corresponds to the economic impact area, although social issues, especially ones present in this analysis, (e.g., the value of an area being open for motorized use or not), are often not limited by these geographic boundaries. For example some visitors from across the Northern Rocky Mountain Region, eastern Idaho, western Wyoming, and the rest of the US, and other countries have a sense of place and existence values that flow from the conditions of the southwestern Montana landscape and natural environments.

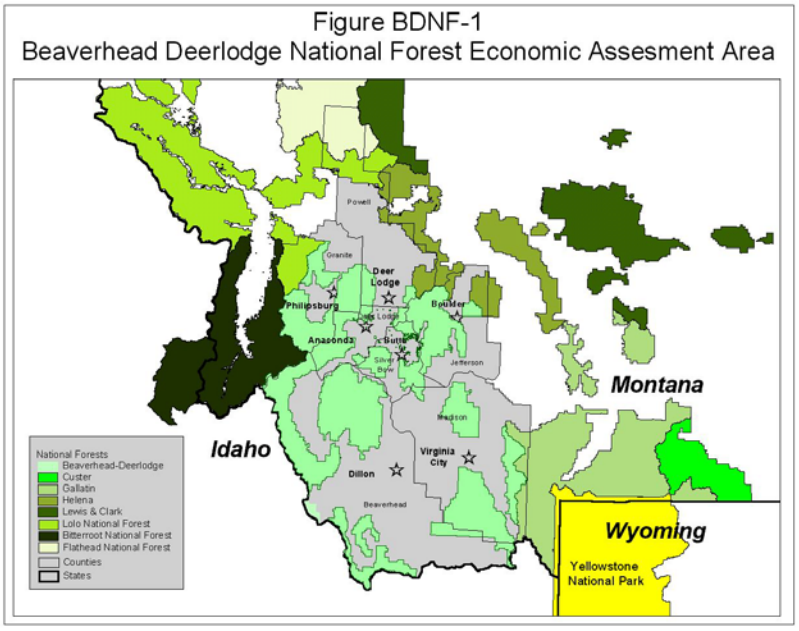

Figure 2. The Beaverhead-Deerlodge Travel Plan economic impact area (missing Broadwater County, Montana).

Economic Consequence Methods

Modeling of economic impacts (changes) using input/output analysis is often conducted to estimate the expected changes in the contribution of jobs and income to local economies resulting from management decisions. In order to model changes to jobs and income, expectations for changes in forest visitation are needed. Although current recreation visitation contributions are provided for the Beaverhead-Deerlodge National Forest, due to the uncertainty regarding recreational visitation changes/displacement that may occur following the decision associated with the Travel Planning Project, an economic impact analysis was not conducted for this assessment. Instead, response coefficients are provided to help the reader estimate changes to the existing contributions. These response coefficients are presented in conjunction with a qualitative description of the likely impacts of the various alternatives.

Job and labor income response coefficients would need to be multiplied by marginal or incremental changes in 1,000 party trips for each activity to estimate any potential changes associated with travel planning proposals. In other words, estimates of potential changes to employment or labor income effects would be based on speculation of either increases or decreases of 1,000 party trips to various motorized and non-motorized activities. For example if the reader believes that hiking would increase by 500 party trips per year under the non-motorized emphasis alternative, the computations to derive effects would require multiplying the hiking response coefficients by 0.5 (500/1,000 party trips) then adding this to current economic contributions. The marginal effects (i.e. response coefficients) are useful for assessing potential changes in the absence of high quality estimates regarding the impacts on visitation under each alternative.

Weaknesses, Limitations and Assumptions of Analysis Methods

As with nearly all economic reporting, there is a time lag associated with data collection which prevents real-time reporting of economic conditions. The most recent data is typically two years old by the time it becomes accessible. Therefore, efforts to describe the existing situation in reality describe the recent past. This is normally not a large problem since many of the changes happen slowly. However, occasionally changes happen rapidly, as was the case in the autumn of 2008 and spring of 2009, when massive structural changes impacted the US economy at large. Much of the data needed to describe these changes will not be available for several years. As a result, some of the data in the tools used in this analysis (e.g. IMPLAN data) may change substantially in the future.

Another limitation of most economic data is the scale at which it is collected and summarized. The smallest level most data is reported at is the county level. Just as in any case where averaging occurs, county-level data essentially represents the average of all the individuals and communities within that county. Depending on the variability of economic conditions, county-level data may not capture significantly different experiences and conditions across the county.

Yet another similar limitation of this document is the problem of reporting conditions for aggregated economic sectors versus reporting individual industries. The reporting provided in this analysis was done with 2-digit aggregation of the North American Industrial Classification System. Attempting to report data at any finer resolution would cause data omission problems, due to disclosure problems in counties with few firms in any single industry. Even if this data were available, the amount of text needed to cover this type of detail would likely not be advisable given the expected impacts to the economy from this Travel Planning Project are small.

One assumption used to estimate the current travel planning economic contributions is that expenditure profiles should be matched with primary activity participation. Some have commented in the past that using total activity participation would change the results. This concern has been voiced by people who feel that if they were surveyed, they might not list their transportation mode of choice

as their primary activity, but that due to this transportation preference, their expenditure profile means they contribute more to the local economy. After considering this concern it has been decided that the best way to handle this is to continue modeling based on primary participation with the caveat that this is the assumption used and may be a source of modeling error.

Along the lines of data time lags, one significant limitation regarding the existing travel planning economic contributions and response coefficients, which are reported below, must be noted. Many comments have been received stating that motorized use on National Forests has grown in recent years. To address this concern, the most recent participation rates have been pulled from the report of Round 2 NVUM for the Beaverhead-Deerlodge National Forest. However, the eight spending profiles and the proportions of user segments (local day, local overnight on forest, local overnight off-forest, non-local day, non-local overnight on forest, non-local overnight off forest, and non-primary, as well as average visits per party trip) from Stynes and White (2005) are all based on Round 1 NVUM data. If this additional data from Round 2 NVUM becomes available, it could be used to update the existing contributions and the response coefficients.

Economic Impacts

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 Beaverhead-Deerlodge National Forest for recreation and the amount of change in the motorized/non-motorized designation of Forest roads and trails be large enough or significant 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 insignificant 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, consider 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 presented in Table 20.

Effects Common to All Action Alternatives

Economic Response Coefficients by Activity Type

Table 10 displays the estimated employment and labor income response coefficients (employment and labor income per 1,000 party trips) for local and non-local motorized and non-motorized activities. The response coefficients indicate the number of full and part-time jobs and dollars of labor income per 1,000 party trips by activity type. The response coefficients are useful in: 1) understanding the economic effects tied to a given use level; 2) understanding projected employment effects for various use scenarios described in other sections of this report, and; 3) understanding the differences in employment and labor income effects by activity type.

These response coefficients are specific to the eight-county economic impact area, in that they use observed empirical economic data to represent direct and multiplier impacts of changes in 1,000 party trips and the associated economic activity in the economic impact area. When spending occurs, some of the money is retained locally as a margin, the remainder leaks to the larger state or national economy. Leakage occurs when indirect purchases are made from vendors outside the economic impact area. In other words, when food is grown, or petroleum is extracted and refined outside the economic impact area, very little of the money spent by Beaverhead-Deerlodge National Forest recreational visitors to purchase these goods is retained and circulated in the local economy. Note that all durable goods, such as recreational vehicles, binoculars, and hiking boots are excluded from these analyses, because these items are used in many settings and therefore cannot be attributed to a single party trip.

Response coefficients provided below show the expected changes in total employment and labor income for every 1,000 party trips for each activity. Table 4 (above) reports the estimated number of party trips for each activity, as local and non-local, by day use and use involving an overnight stay. Party sizes average 2.4 visits per party but range by activity type and user category (e.g., local overnight, non-local day use) from 1.3 to 3.1. To simplify the impact calculations, take any expected change in the number of party trips to the Beaverhead-Deerlodge National Forest, associated with travel management, and first divide these by 1,000 to match the response coefficients. Next, multiply the result with the response coefficients. For example, if one expected full implementation of an alternative to lead to 10% fewer non-local OHV/Motorized Trail party trips where participants stay overnight each year. This would mean a reduction of 1080 party trips. Then the impacts would be a reduction of 1,080 / 1,000, multiplied with the appropriate response coefficient (1.08 * 0.959 jobs) which equals 1.04 jobs. In other words this reduction of 1080 non-local OHV/Motorized Trail activity party trips would lead to a loss of about one job and a the loss of roughly $19,162 (1.08* $17,743) in labor income each year. If full implementation of this same alternative led to an increase of 1000 (or 4%) for overnight hiking party trips this would lead to 1,000 / 1,000 multiplied with the appropriate response coefficients (1.0 * 1.076) which equals 1.08 or roughly one job. In other words, this increase of 1,000 non-local hiking trips where hikers stayed overnight, would lead to an increase of about one job and roughly $21,987 (1.0 * $21,987) more in labor income each year. If both of these situations occurred at the same time there would be very little if any change to the economic contributions made annually.

As shown in Table 25, the economic effects tied to local visitation are roughly equal to that for non-local visitation. Economic effects do vary widely by activity type. Based on response coefficients, the strongest employment effect modeled is tied to non-local overnight cross-country skiing, followed closely by the shared response coefficient for most non-local, overnight non-motorized activities and non-local overnight snowmobiling. Recent data for the Beaverhead-Deerlodge National Forest shows roughly 5,165 overnight cross country party trips each year, where the visitors are using the Beaverhead-Deerlodge National Forest and roughly 687 overnight snowmobiling party trips each year, where the visitors are using the Beaverhead-Deerlodge National Forest. Of the local day response coefficients, local snowmobiling provides the highest response coefficients, followed by local OHV day use and then by cross country skiing. Smaller response coefficients are associated with local day horseback riding, backpacking, hiking/walking, and bicycling (Note: the response coefficients are identical for several of these categories since they share the same spending profiles). 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.

Table 25. Employment and Labor Income Response Coefficients by Activity Type

	Employment (Jobs / 1,000 Party Trips)		Labor Income ($ / 1,000 Party Trips)	
Non-motorized Use	Day Total	Overnight Total	Day Total	Overnight Total
Local Horseback Riding	0.122	0.457	$2,256	$8,744
Non-local Horseback Riding	0.226	1.076	$4,604	$21,987
Local Backpacking	NA	0.656	NA	$12,255
Non-local Backpacking	NA	0.7103	NA	$14,379
Local Hiking / Walking	0.122	0.457	$2,256	$8,744

	Employment (Jobs / 1,000 Party Trips)		Labor Income ($ / 1,000 Party Trips)	
Non-motorized Use	Day Total	Overnight Total	Day Total	Overnight Total
Non-local Hiking / Walking	0.226	1.076	$4,604	$21,987
Local Bicycling	0.122	0.457	$2,256	$8,744
Non-local Bicycling	0.226	1.076	$4,604	$21,987
Local Cross-country Skiing	0.176	0.667	$3,245	$13,477
Non-local Cross-country Skiing	0.276	1.112	$5,098	$22,464
Local Other Non-motorized	0.122	0.457	$2,256	$8,744
Non-local Other Non-motorized	0.226	1.076	$4,604	$21,987
Motorized Use				
Local OHV	0.247	0.576	$4,472	$10,647
Non-local OHV	0.388	0.959	$7,030	$17,743
Local Driving for Pleasure	0.148	0.377	$2,654	$7,410
Non-local Driving for Pleasure	0.232	0.629	$4,172	$12,352
Local Snowmobiling	0.444	0.603	$8,097	$11,118
Non-local Snowmobiling	0.605	1.005	$10,800	$18,530
Local Other Motorized Act.	0.247	0.576	$4,472	$10,647
Non-local Other Motorized Act.	0.388	0.959	$7,030	$17,743

In summary, for the five-county economic impact area used in this analysis, the total economic contributions of recreation overall, and specifically recreation tied to motorized and non-motorized activities, are very small compared to the total economic activity in the area. Though changes in use attributable to the alternatives outlined in this report are difficult to estimate, even large changes in use would have little effect on the overall economy of the eight-county area.

The potential recreational impacts such as displacement noted in the Recreation section of this document may impact individual vendors and service providers in the economic impact area. However, detailed quantified speculation of changes to tourism and recreation visitation in the eight economic impact area counties would be required to estimate the direct and multiplier (indirect and induced) economic impacts. This data is not available. Some substitute recreation and travel opportunities persist inside and near the economic impact area suggesting that any changes to the miles of roads and trails affected by the decision will have minimal impact on the overall economy of these eight counties. It is important to remember that the lands affected by the Beaverhead-Deerlodge Travel Management decision are only a small part of the recreation and tourism opportunities in these eight counties (compared with wildlife viewing, guided and unguided hunting, skiing, guided and unguided fishing, dude ranching, and vacation opportunities in areas like the Madison, Jefferson, and

Missouri Rivers, Rock Creek, Virginia City, and the greater Yellowstone ecosystem. 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.

Collectively, Forest Service employment and program expenditures generally contribute roughly one to three percent of the jobs and labor 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 Beaverhead-Deerlodge National Forest 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 eight-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 0.0 for Butte-Silver Bow County to 12.5% for Madison County) 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.

Conclusions

In general, the economic impact area profiled in this section appears fairly healthy with increases in employment and real personal income, and substantial increase in per capita personal income during the period from 1970 to 2005. All counties have winter unemployment rates roughly twice that of the annual low, occurring in September and October, and there has been a short-term unemployment increase associated with the national recession during 2008 and 2009. Change is a constant in many areas, especially for those areas dependent on natural resources. Undulations in both the labor income and the growing portion of non-labor income may generate some instability for many of the economic indicators used to proxy economic well-being. The influence of the global economic recession will be difficult to predict in some of these variables. Trends, like growth in service sector employment and income found in these counties, are shared by most peer counties across the Rocky Mountain west. These growth trends are largely driven by population growth of both permanent and seasonal residents, and the changes in travel management in the Beaverhead-Deerlodge area is unlikely to have a noticeable impact on these economic indicators.

The community in this economic impact area is certainly getting older, and OHV research indicates this may contribute to lower participation rates, but greater days of use per year for users as people age. On the other hand, there have been increases in OHV registrations and a larger portion of Beaverhead-Deerlodge National Forest visitors listing driving for pleasure as their primary activity for fiscal year 2006 than what was reported for calendar year 2000.

The overall contribution that recreation activities and associated spending make to the jobs and labor income of the economic impact area are currently less than one half of one percent, indicating that small changes to these spending levels would not have significant impacts to the impact area. However, a few vendors and service providers may be impacted based on site-specific changes to motorized recreation opportunities. New non-motorized recreation and motorized travel opportunities within a short drive may emerge, and they would likely moderate any negative impacts to many of these businesses, from proposed travel management changes. Proposed travel management changes may also promote additional new business opportunities in the long term.

Wildlife

Existing Condition

Roads on National Forest System (NFS) lands in the Tobacco Root and Gravelly mountains are designed and maintained for speeds suitable for mountainous terrain and a comparatively low travel volume. For the most part, safe travel speed on these routes is below 25 miles per hour, and the volume of wheeled motorized traffic is generally light. Data on vehicle related mortality specific to the Tobacco Root and Gravelly mountain ranges are lacking.

The Tobacco Root Landscape is an island of high peaks, snowy basins, alpine lakes, forested slopes and rolling foothills. The vegetation of the Tobacco Root Landscape evolved with varying levels and types of disturbance. Prior to Euroamerican settlement, lightning fires burned without broad-scale human attempts at control and Native Americans used wildland fire for a variety of purposes. With the arrival of settlement in the mid 1860s, mining, logging and associated roading, and domestic livestock grazing became the dominant disturbance processes in this landscape. The forest cover on today's landscape reflects extensive timber harvest beginning in the gold rush era of the 1860s.

By 1865, disturbance associated with fire had been largely eliminated. Fire suppression has altered physical stand structure and composition of forest and rangeland vegetation by allowing vegetation to move toward a later seral stage over a greater spatial extent than corresponding patterns prior to the broad-scale suppression of fires.

National Forest system lands in the Tobacco Root Mountains landscape have a summer motorized route density of approximately 1.2 mi/mi². For the most part, these roads are in the lower one-third of the mountain range and are concentrated on the east, south and southwest sides.

Figure 3. Madison RD Landscapes

The Gravelly and parts of the Tobacco Roots Landscapes are within the Greater Yellowstone Area (GYA) and contributes important secure habitat for grizzly bears, wolverine, bighorn sheep, wolves, elk and other wildlife species. The Gravelly Landscape has a comparatively high percentage of non-forested habitat including wet meadows, riparian areas, aspen stands, sagebrush shrublands and alpine grasslands. Open parks and meadows in the Gravelly Landscape form an extremely valuable forage

resource for big game. This resource has helped to foster elk populations that have met or exceeded State population objectives for the Gravelly landscape. For the past several years Montana Fish, Wildlife, and Parks has instituted either sex elk harvest during the general hunting season to help reduce existing populations. Forest habitats include lodgepole pine, Douglas fir, spruce, subalpine fir and whitebark pine.

The Gravelly Landscape has a combined open road/open motorized trail density of approximately 0.8 mi/mi. This landscape has the lowest road densities of any landscape outside the Madison Landscape, which is almost entirely designated wilderness.

The Gravelly and Tobacco Root landscapes are managed with area restrictions for motorized vehicle travel, as shown on the 1996 Interagency Visitor Map. In the Gravelly Landscape, off-road motorized travel for camping only is limited to a very few locations. In the Tobacco Root Landscape, off-road motorized travel is currently permitted for dispersed camping within 300 feet of an established, designated motorized route. Many specific motorized routes are also restricted to motorized use seasonally or yearlong.

Effects Analysis

Analysis Parameters Considered in this Evaluation

The Beaverhead-Deerlodge NF 2009 Revised Forest Plan (USDA 2009b, P. 45 -47) directs providing for wildlife secure areas and connectivity by managing the density of open motorized roads and trails by landscape and hunting unit. For this analysis, motorized route density is the measure used to address the effects of the alternatives on wildlife disturbance for terrestrial species.

The goal for the Gravelly Landscape is to achieve secure habitat at 60% or greater for grizzly bear security. (USDA 2009 b, Pg. 45)

The FEIS (USDA 2009a) for the Forest Plan has identified open motorized road density as a primary effects indicator for wildlife (P. 485).

Secure habitat is defined as areas larger than 10 acres that are 1/3 of a mile or more from a route open to motorized vehicles. (USDA 2009a, pg. 302). The definition is a synthesis of recreation considerations, Wisdom et al (2004), and the 2006 Yellowstone Grizzly Bear Amendment Record of Decision discussed in the FEIS (USDA 2009a, pg. 488)

Elk are wildlife Management Indicator Species (MIS) under the Forest Plan. "Open, motorized roads and trails are the greatest consideration on summer range relating to habitat effectiveness (Christensen et al. 1993 in USDA 2009a, pg. 488). Open road density and season of use is another primary elk vulnerability consideration, as hunting is the primary source of elk mortality (Christensen et al. 1993 in USDA 2009a, pg. 488)"

"Managing for lower open motorized road densities may allow large mammals to move across the forest without major disturbance from vehicles. Secure areas address concerns about "linkages" across large landscapes." (USDA 2009a, pg. 489)

This project would make modifications to the existing 1996 Travel Plan in the Gravelly Landscape and the Tobacco Root Landscape under the jurisdiction of the Madison Ranger District. The resulting decision, regardless of the alternative or chosen combination, is unlikely to directly impact forest, sagebrush shrub land or meadow vegetation. The decision would not result in the construction, reconstruction or relocation of any road or trail. Any physical impacts to wildlife habitat resulting from implementation of the proposed action are anticipated to be rare and extremely minor, if in fact

any impacts occur. No vegetation management would occur under the proposed action. Consequently, vegetation impacts at any scale are not considered in this analysis.

Also not considered in this analysis are habitat conditions in the Madison Mountain range. There are few motorized routes in the Madison Mountains, none of which are proposed for change under this decision. The bulk of the Madison Range is congressionally designated wilderness, with no mechanized activities allowed.

Summer motorized route density is measured at the landscape scale (Figure 3).

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed species in table 26 below, may be present on the Beaverhead-Deerlodge National Forest: (USDI Fish and Wildlife Service 2009a).

Table 26. Endangered Species Act Section 7 Species List

Table 21 Endangered Species Act (ESA) Section 7 species list		
COMMON NAME	SCIENTIFIC NAME	STATUS RANGE – MONTANA
Bull trout	Salvelinus confluentus	Threatened-Clark Fork, Flathead, Kootenai, St Mary, and Belly river basins; cold water rivers and lakes.
Yellow-billed cuckoo (western population)	Coccyzus americanus	Candidate-Population west of the Continental Divide; riparian areas with cottonwoods and willows
Grizzly Bear	Ursus arctos horribilis	Threatened-Resident, transient; Alpine/subalpine coniferous Forest (A separate biological assessment is being prepared with formal consultation to be initiated with US Fish & Wildlife Service

As per the US Fish and Wildlife Species list (USDI Fish and Wildlife Service 2009a) for the BDNF, the grizzly bear is the only ESA listed species to consider for this project. A biological assessment is in preparation since the Yellowstone Distinct Grizzly Bear Population segment's relisting in September, 2009.

Table 27 BDNF Sensitive and Special Interest Species List

Table 27. Forest Service sensitive and special interest species on the BDNF				
Sensitive Birds		Sensitive Mammals		Special Interest
American Peregrine Falcon (Falco peregrinus anatum)		Fisher (Martes pennanti)		Northern Goshawk (Accipiter stiatus)
Black-backed woodpecker (Picoides arcticus)		Great Basin Pocket Mouse (Perognathus parvus)		Great grey owl (Strix nebulosa)
Flammulated Owl (Otus flammeolus)		North American Wolverine (Gulo gulo luscus)		
Greater Sage-Grouse (Centrocercus urophasianus)		Northern Bog Lemming (Synaptomys borealis)		

Table 27. Forest Service sensitive and special interest species on the BDNF				
Sensitive Birds		Sensitive Mammals		Special Interest
Harlequin Duck (Histrionicus histrionicus)		Pygmy Rabbit (Brachylagus idahoensis)		
Trumpeter Swan (Cygnus buccinator)		Towsend's Big-Eared Bat (Corynorhinus townsendii)		
Bald eagle (Haliaeetus leucocephalus)		Gray Wolf (Canis lupus)		
		Spotted Bat (Euderma maculatum)		

Not all of the Beaverhead-Deerlodge NF sensitive species are germane to analysis of the projects effects due to lack of vegetation/habitat impacts, lack of occurrence on the Madison Ranger District, or lack of new road building. Those species with asterisks (**) are assessed in detail.

Table 28. Sensitive Species in the project area

Table 28. Sensitive Species List				
Sensitive Species/Special interest		Habitat/Range		Disturbance
American Peregrine Falcon (Falco peregrinus anatum)		Cliff habitat. Only known nest on Forest Service lands is west of Hidden Lake on Madison RD. Figure 4		No habitat impacts. No change from existing condition. No impact to species. No further analysis required
Black-backed woodpecker (Picoides arcticus)		Forested habitat. Insect& disease caused tree mortality is increasing across the district, providing additional habitat. More than 79,000 additional acres reported for 2006 & 2007. The heaviest defoliation was reported on the Madison (39,812 acres) and the old Sheridan (40,059 acres) Ranger Districts. (USDA 2008)		No habitat alteration from change in motorized route status. No impact to species. No further analysis required.
Flammulated Owl (Otus flammeolus)		Forested habitat. Ponderosa pine is preferred habitat. Figure 5		The Gravelly and Tobacco Root mountains do not support ponderosa pine habitat, and surveys in the project area have not conclusively documented breeding. No vegetation management would occur under any action alternative. No further analysis required
Greater Sage-Grouse (Centrocercus urophasianus)		Sagebrush habitat. Breeding sites (leks) are not found on the Forest. Figure 6		There are no habitat impacts from changing motorized route classifications. There are no breeding sites (leks) anywhere on the Madison RD. No further analysis required

Table 28. Sensitive Species List				
Sensitive Species/Special interest		Habitat/Range		Disturbance
Harlequin Duck (Histrionicus histrionicus)		Fast moving, low gradient, clear mountain streams. Breeding has been documented only in Granite County (Rock Creek) on the Forest. Portions of Powell and Jefferson County include transient records. The heart of breeding activity occurs well outside the Forest in northwest Montana. The one breeding record for the Forest is located on the Middle Fork of Rock Creek approximately 2 miles south of Moose Lake on the Pintler RD. Figure 7.		The most robust populations near the Madison RD are found in Yellowstone NP. The Harlequin Duck population in Yellowstone NP continues to maintain itself and is only mildly variable from year to year, with generally 16–22 nesting pairs residing in the park. (McEneany 2003). There are no habitat impacts from changing motorized route classifications. No further analysis required
Trumpeter Swan (Cygnus buccinator) **		Trumpeter swans nest in the marshy borders of lakes and ponds. Known nesting occurs at Conklin Lake, a private in-holding. Nearby Elk Lake has not had documented swans during the Fall breeding surveys (2002 – 2008) USDI F&WL Service 2009c Figure 19		Forest Road 3931 is located within a short distance of Conklin Lake and does afford views of the lake. The road gets limited use. Administrative and recreational traffic along the road could potentially result in disturbance of nesting swans. See detailed analysis
Bald eagle (Haliaeetus leucocephalus) **		Nest almost exclusively in live trees usually within 1 mile and in line of sight of a large river or lake. Scattered across southwest Montana. Map Figure 21		Bald eagles currently nest along the Channels portion of the Madison River from Ennis to Ennis Lake, east of the Gravelly and Tobacco Root mountains and near Ruby Reservoir to the west of the Gravelly Mountains. See detailed analysis
Fisher (Martes pennanti)		Forested habitat. Detections are limited to north and west of the Big Hole Valley (USDA 2009a, Appendix B). There are no known locations on the Madison RD Figure 8		No habitat impacts. No change from existing condition. No impact to species. No further analysis required

Table 28. Sensitive Species List				
Sensitive Species/Special interest		Habitat/Range		Disturbance
Great Basin Pocket Mouse (Perognathus parvus)		Occupied habitats in Montana are arid and sometimes sparsely vegetated. They include grassland-shrub land with less than 40% cover, stabilized sand hills, and landscapes with sandy soils, more than 28% sagebrush cover, and 0.3 to 2.0 (12 – 78") meters shrub height. Known from Beaverhead County and suspected in Madison County, there are no known detections on the Forest. Montana is peripheral to the species range. Figure 9		No habitat impacts. No impact to species. No further analysis required
North American Wolverine (Gulo gulo luscus)		Wolverine habitat can be characterized by higher elevations, rugged terrain, spring snowpack, the presence of conifer forests, and edge associated with alpine timberline where there is typically a mix of subalpine parklands and meadows in the subalpine zone (Inman et al. 2007). Copeland et al (2007) describe elevation as the key variable for distinguishing the species' presence, with higher elevations preferred. Denning Model Map Figure 10 Winter non-motorized map Figure 11		While human disturbance may in general affect wolverine distribution, the highest potential for negative disturbance impacts is theorized to be disturbance at den sites. This species lives at low densities under the best of circumstances; hence disturbance during this critical period may potentially have adverse effects on survival of young wolverines. There are no habitat impacts from changing motorized route classifications. The Forest Plan has made non-motorized winter allocations that will not be changed by this process. No further analysis required
Northern Bog Lemming (Synaptomys borealis)		Bog lemming populations occur primarily in sedge or alder-willow bogs on the edge of spruce-fir and/or lodgepole pine forest, and sphagnum bog mats are considered important (summarized in Hart et al. 1998). In Montana, the northern bog lemming is at the southern margin of its global range. There is no known occurrence on the Madison RD. Figure 12		No vegetation management is proposed. There are no impacts to bog habitat. Only motorized route designations will be changed. No further analysis required

Table 28. Sensitive Species List				
Sensitive Species/Special interest		Habitat/Range		Disturbance
Pygmy Rabbit (Brachylagus idahoensis)		Sagebrush habitat. Tall clumps of Big Sage are particularly desirable with shrub canopy cover > 21%. Species also needs loose, Friable soil generally deeper than 14" for burrow excavation (Weiss and Verts 1984 summarized in Hart et al. 1998). Montana lies on the northeastern edge of pygmy rabbit distribution. There are confirmed records dating back to 1918 from three southwestern counties (Beaverhead, Jefferson, Madison), with most of the Montana range in Beaverhead County (Montana Field Guide, Pygmy Rabbit Species Account). No documented detections on the Madison RD. Figure 13		There are no habitat impacts from changing motorized route classifications. No further analysis required
Towsend's Big-Eared Bat (Corynorhinus townsendii)		The Townsend's big-eared bat is found throughout south-central Montana. Key habitat components include caves and mines during all stages of its life cycle, but specifically for winter hibernacula and maternity colonies. Large tree cavities and hollow trees are known to be used for day roosts. The only known maternity colony is located at Lewis and Clark Caverns State Parks, persisting for over a century. Figure 14		There would be no impact to the types of habitat that the species uses, such as caves, mine shafts, tunnels, abandoned buildings from implementation of any alternative. No further analysis required
Gray Wolf (Canis lupus) **		Habitat generalist. Packs are established throughout southwest Montana. In general, wolves depend upon big game (elk, moose, and deer) for food year around. Consequently they can be found wherever there are sufficient prey species to sustain them. Many packs range across portions of the Madison RD. Figure 23		Illegal shooting and vehicle trauma constitute a combined 24% of the human caused mortality for wolves in Montana. This amounts to slightly more than 21% of total mortality. See detailed analysis

Table 28. Sensitive Species List				
Sensitive Species/Special interest		Habitat/Range		Disturbance
Spotted Bat (Euderma maculatum)		Spotted bats have been encountered or detected most often in open arid habitats dominated by Utah juniper and sagebrush, sometimes intermixed with limber pine or Douglas-fir, or in grassy meadows in ponderosa pine savannah. Cliffs, rocky outcrops, and water are other attributes of sites where spotted bats have been found. The only detections on the Beaverhead-Deerlodge NF are located on the eastern edge of the Pioneer Mountains approximately 30 miles west of Madison RD lands. Figure 15		Reclassifying motorized routes would have no impact on spotted bat habitat. No further analysis required
Northern Goshawk (Accipiter gentilis) special interest		Forested habitat. Goshawks typically select nest sites in mature coniferous forests with relatively closed canopies (50 to 90%), and open understory conditions. The species is distributed across the forest with most detections northwest of Dillon. Figure 16		With no vegetation treatment proposed by this project, simple reclassifying of motorized routes would have no impact on goshawk habitat. No further analysis required.
Great grey owl (Strix nebulosa) special interest		Species requires mid- or late-succession conifer forests containing large, broken-top snags (> 24 in, dbh) for nesting, canopy closure greater than 60% in at least portions of the forest stands adjacent to meadows or other openings that have sufficient herbaceous cover to support pocket gophers and microtine rodents. Species range encompasses all of southwest Montana. Figure 17		With no vegetation treatment proposed by this project, simple reclassifying of motorized routes would have no impact on great gray owl habitat. No further analysis required.

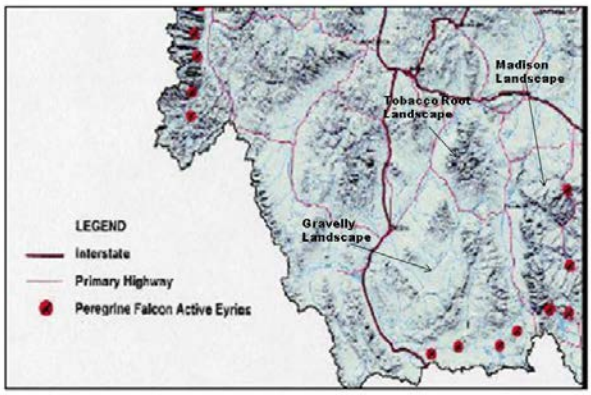

Figure 4: Active Peregrine Eyries in SW Montana (Sumner & Rogers. 2003)

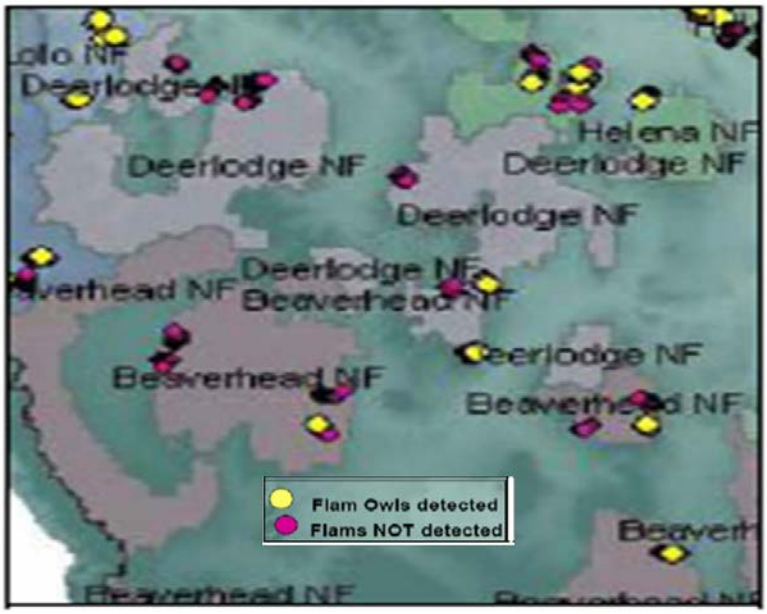

Figure 5: Flammulated owl detections (Cilimburg 2006)

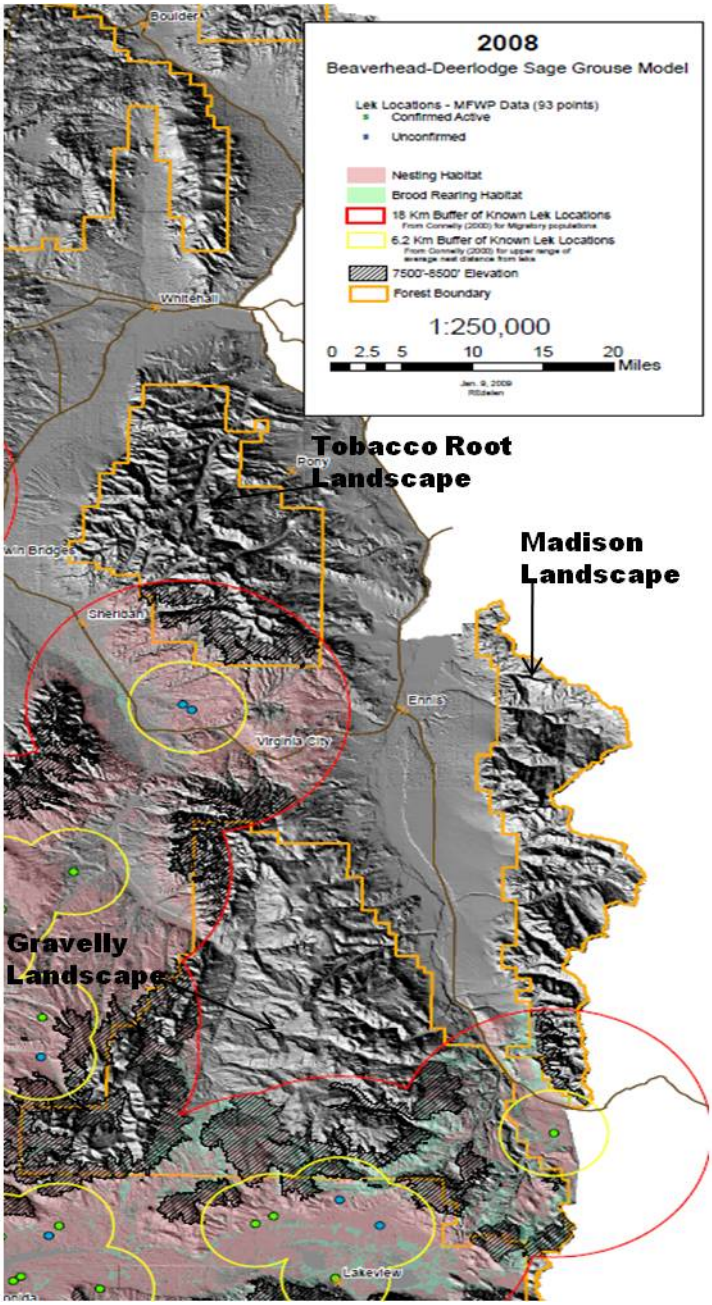

Figure 6. Sage grouse lek locations.

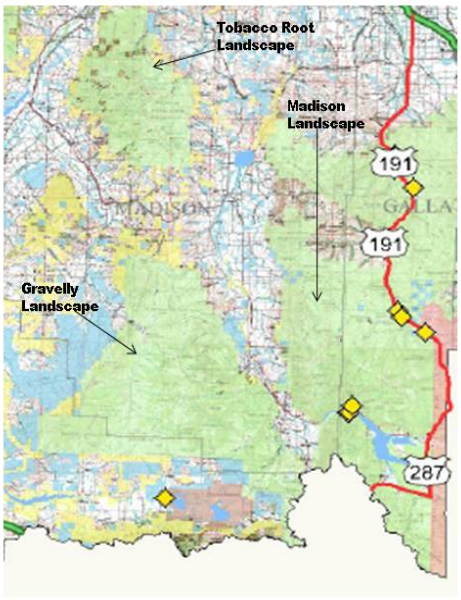

Figure 7. Harlequin duck detections 1990 - 2009 near the Madison RD. Montana Natural Heritage Tracker.

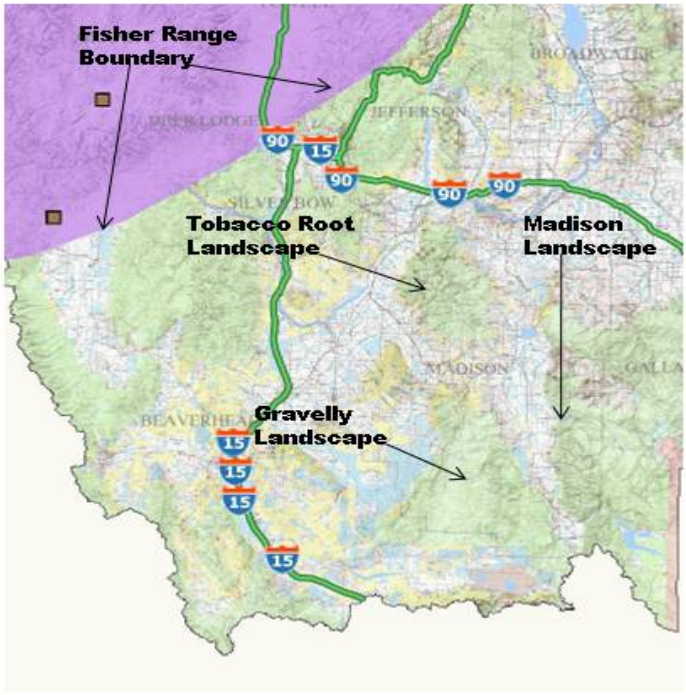

Figure 8. Fisher range and detections near Madison RD. 1990-2009. Montana Natural Heritage

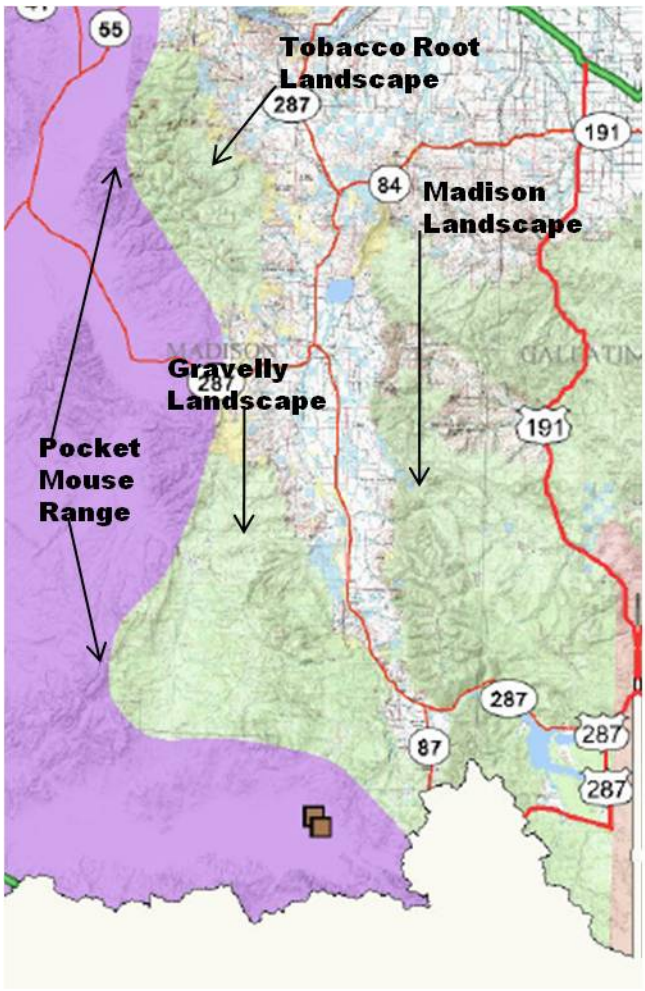

Figure 9. Great Basin pocket mouse range and detections 1990-2009. Montana Natural Heritage.

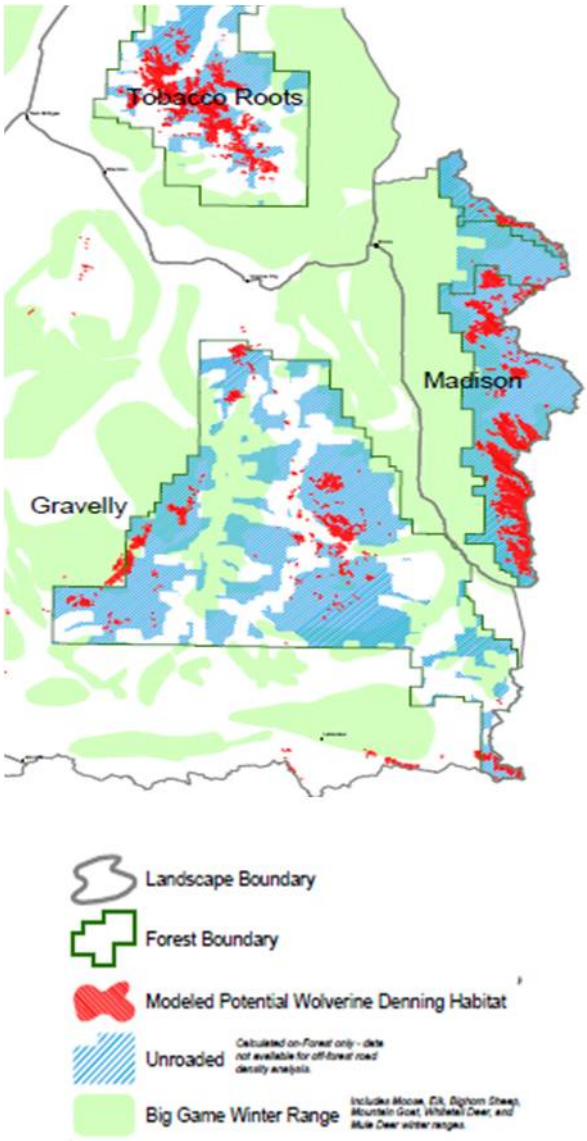

Figure 10. Modeled wolverine denning habitat on Madison RD

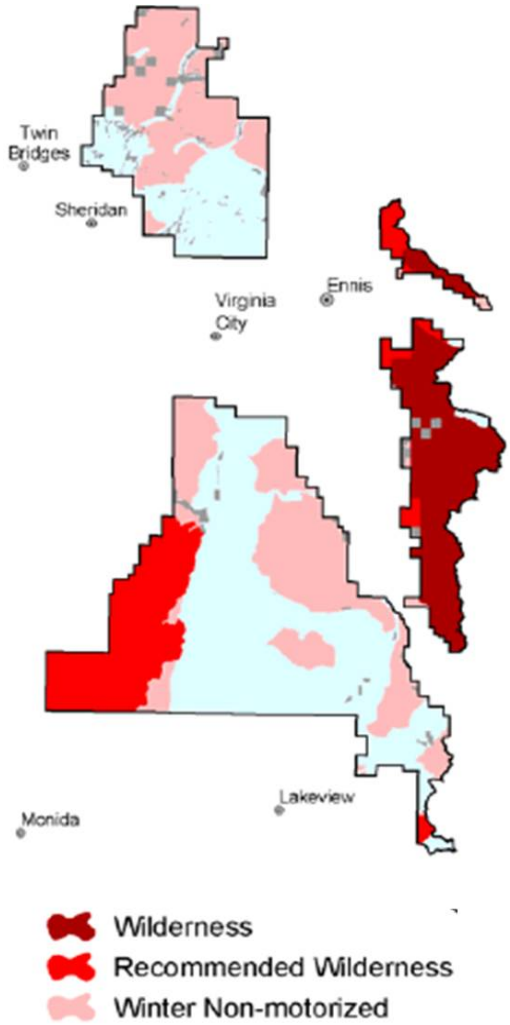

Figure 11. 2009 Forest Plan Winter non-motorized allocations on the Madison RD.

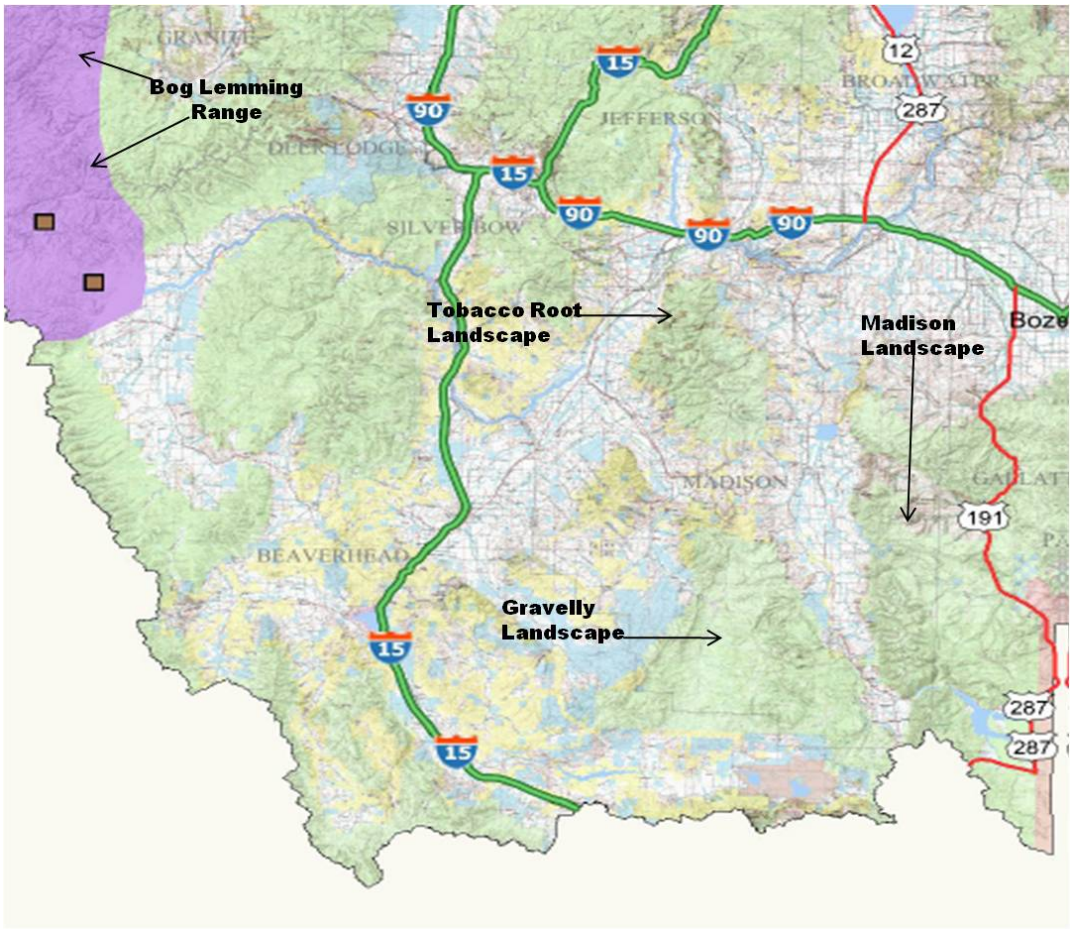

Figure 12. Northern bog lemming range and detections 1990-2009. Montana Natural Heritage.

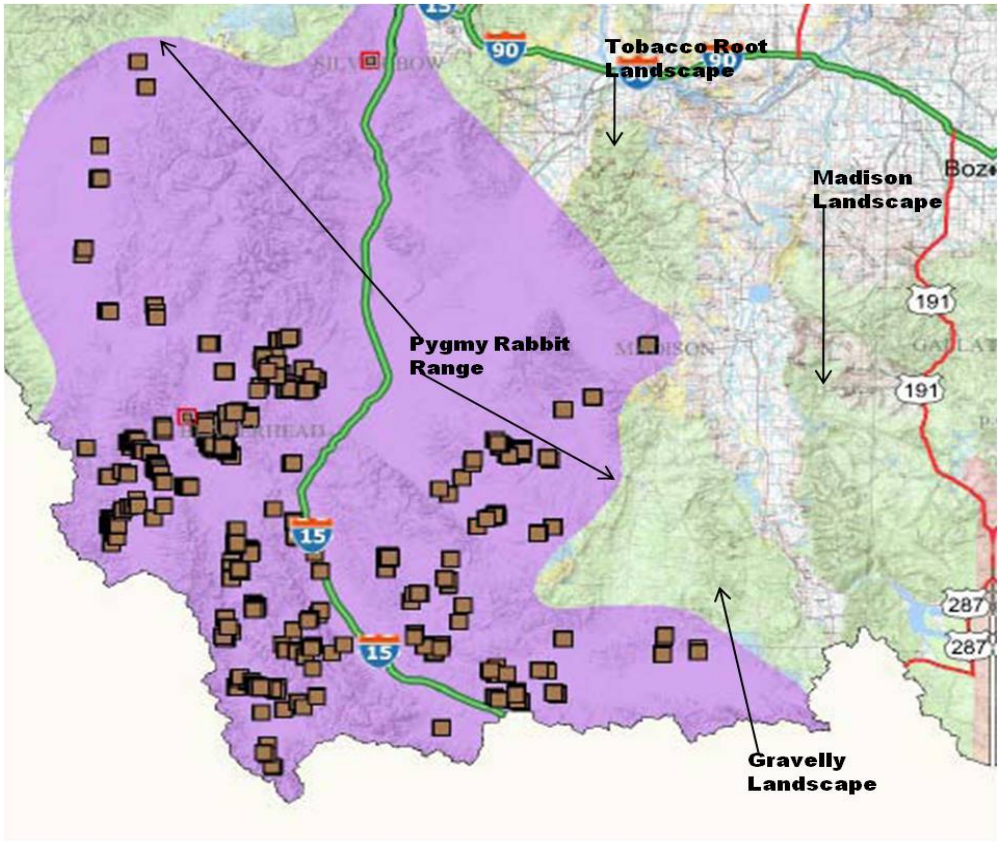

Figure 13. Pygmy Rabbit range and detections 1990-2009. Montana Natural Heritage.

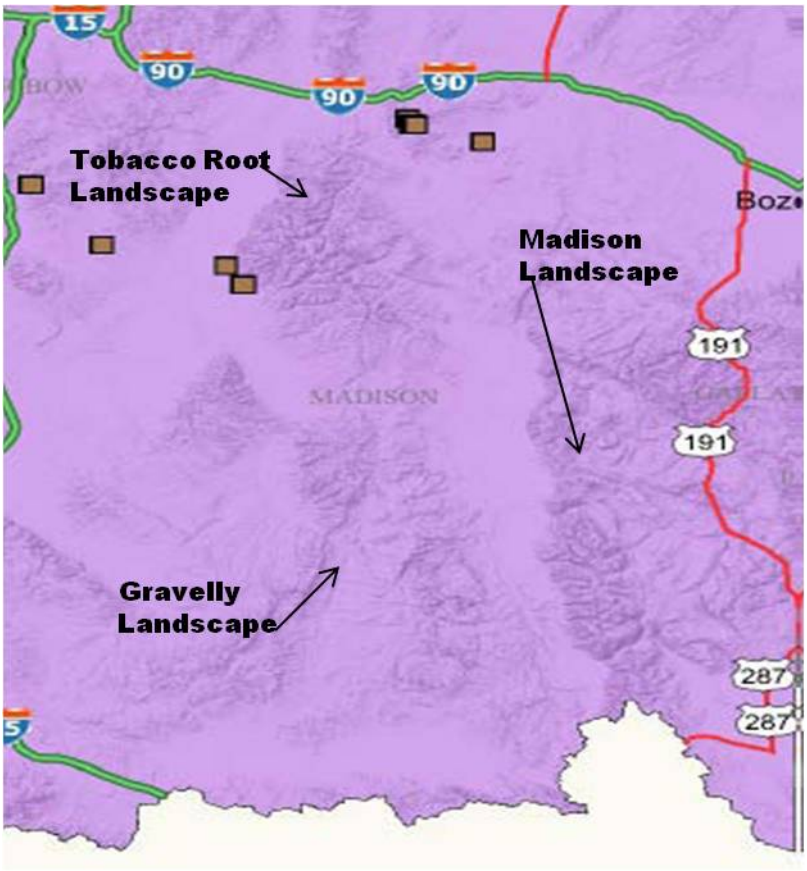

Figure 14. Townsend's big-eared bat range and detections 1990-2009. Montana Natural Heritage.

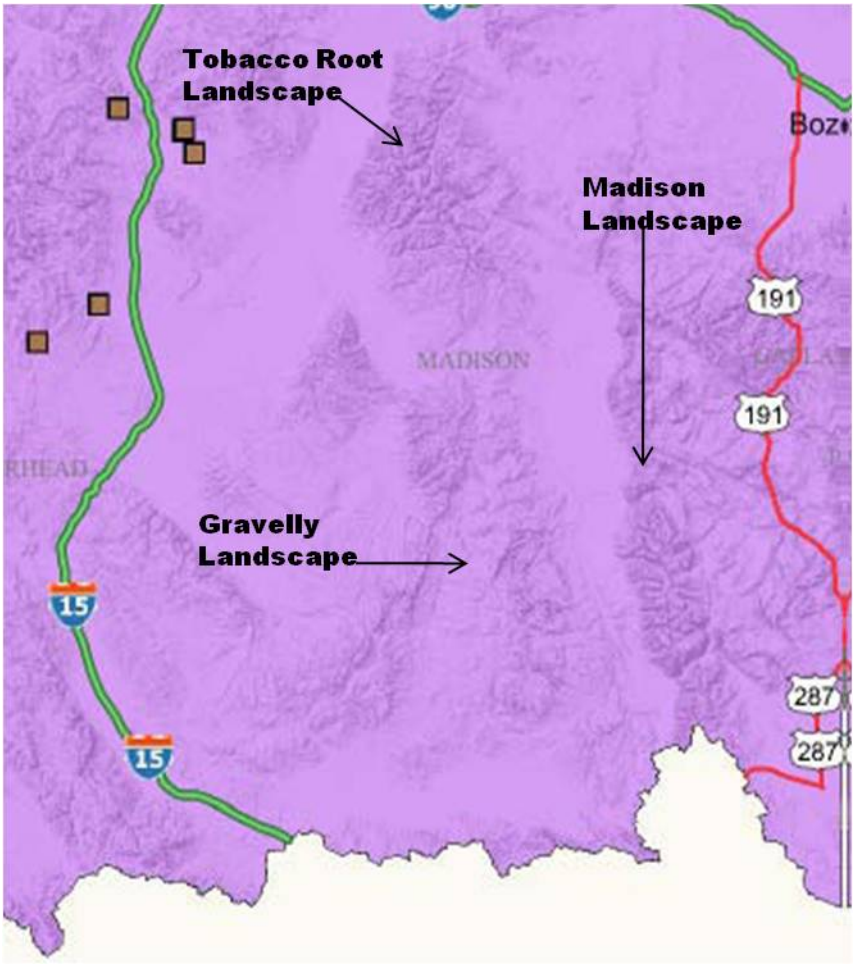

Figure 15. Spotted bat range and detections 1990-2009. Montana Natural Heritage

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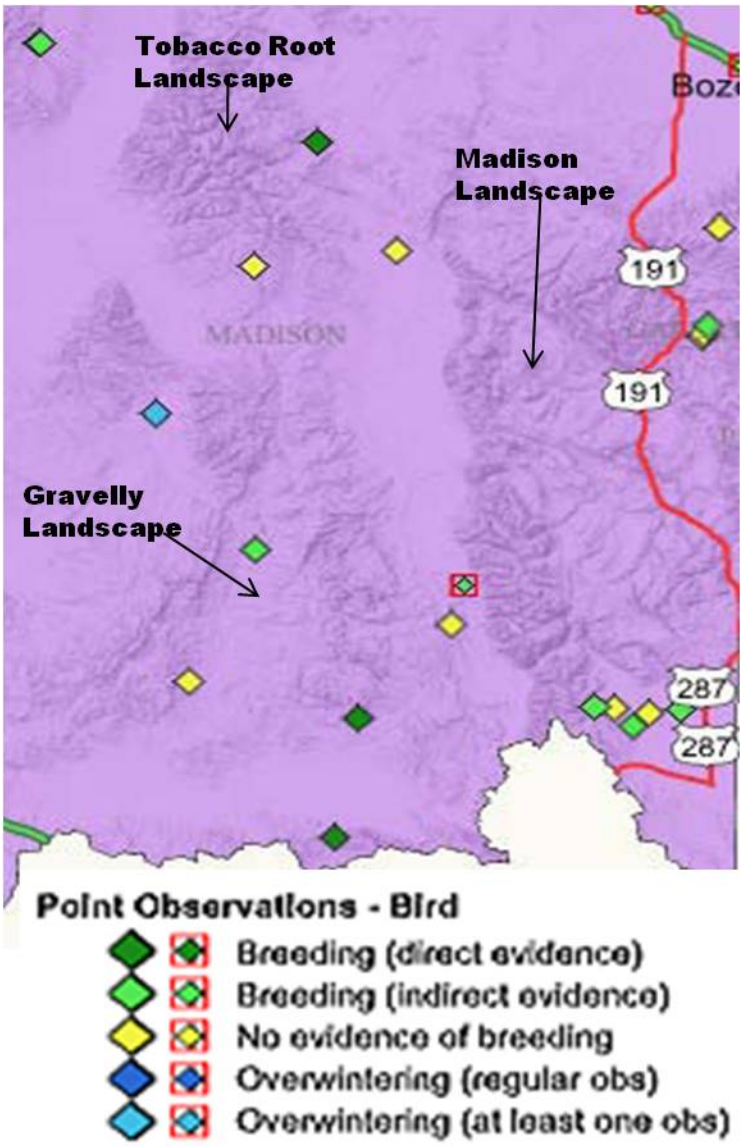

Figure 16. Goshawk range and detections 1990-2009. Montana Natural Heritage.

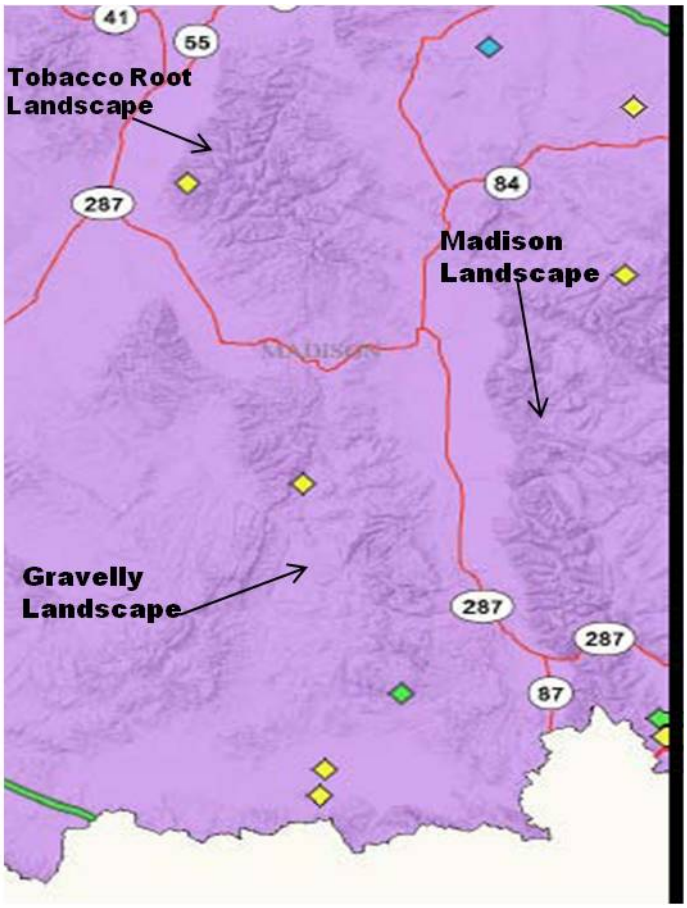

Figure 17. Great gray owl range and detections 1990-2009. Montana Natural Heritage.

Sensitive Species Assessed in Detail

Trumpeter Swan (Cygnus buccinator)

The trumpeter swan is the largest species of waterfowl in North America. Adult trumpeter swans commonly have a wingspan of 7 to 8 feet and may weigh up to 30 pounds. The plumage of adult trumpeter swans is completely white, but is often stained gray to light brown by sediment or iron suspended in water. Plumage of birds less that 1 year old (cygnets) is typically gray. Trumpeter swans form long term pair bonds, which may last for the life of one or both birds.

The core "Tri-State Area" is the portion of Idaho, Wyoming, and Montana within which almost all Tri-state trumpeter swans summered and most Canadian and Tri-state swans wintered during much of the 20th century, prior to expansion efforts that began in the late 1980s (Pacific Flyway Study Committee 2002).

From 1972 – 2008 counts of birds in Montana (white birds & cygnets) increased slightly by approximately 1.9% / year, whereas rates of growth for birds wintering in Idaho and Wyoming were much higher at approximately 7.3% / year (USDI Fish& Wildlife Service 2009c).

During the 1970s and early 1980s about 36% of wintering swans were counted in Montana, only about 15% of the birds wintering in the tri-state area have been counted there during the last decade ((USDI Fish & Wildlife Service 2009c). In contrast, the percentage of birds in Idaho has increased from about 53% to about 69% during that same time period (USDI Fish & Wildlife Service 2009c). The percentage of birds counted in Wyoming during winter also has increased, from about 11% to 16%.(USDI Fish & Wildlife Service 2009c). Total winter swan counts in the Tri-State area have increased from 709 in 1974 to 5160 in 2009 (USDI Fish & Wildlife Service 2009c)

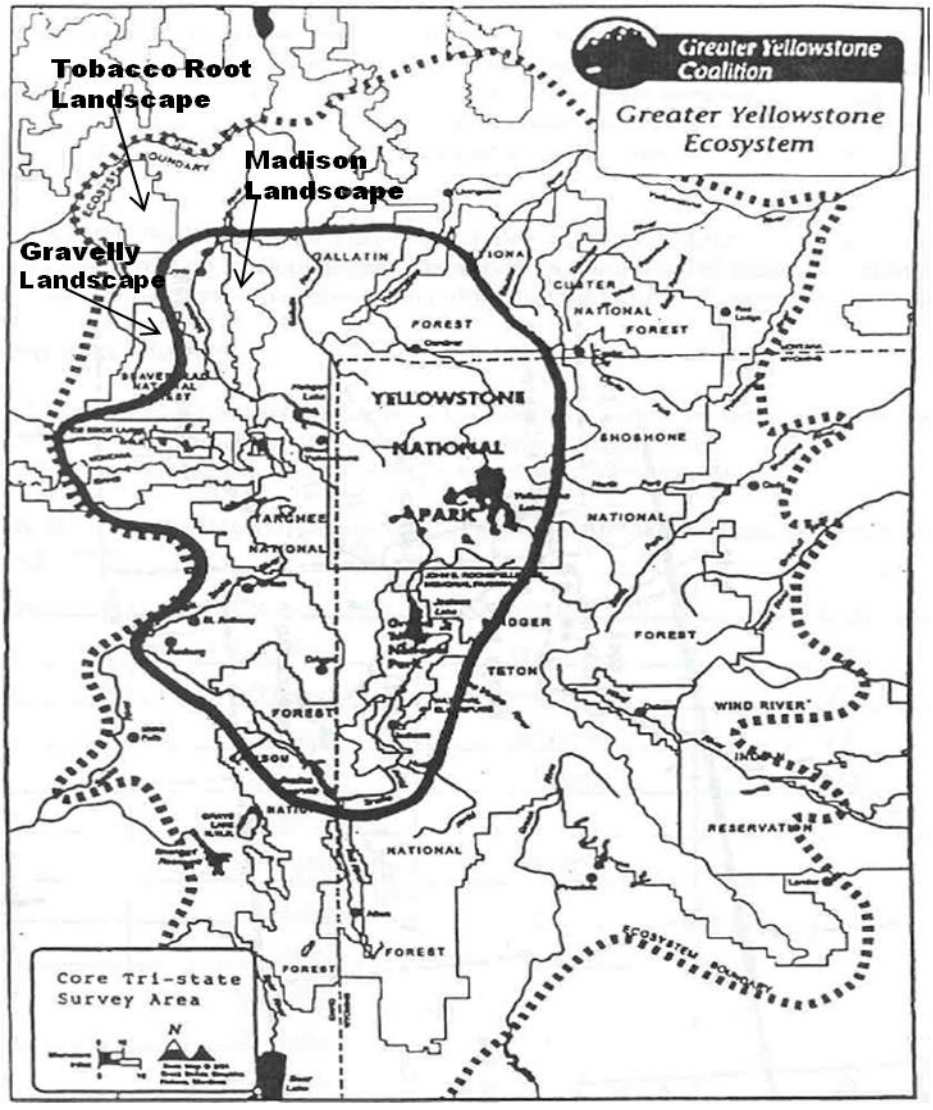

Figure 18. Core Tri State Area.

Trumpeter swans are resident and migratory species on the southern end of the Forest, and nesting habitat is associated with lake edge and marshland. Nesting pairs are highly territorial and rarely allow another pair to nest on the same water body (Travsky et al 2004). The most serious threat to trumpeter swans is the loss of undisturbed breeding and (especially) wintering habitat to expanding

human populations. Urban expansion, rural residential development, and recreation often preferentially occur in and adjacent to environments preferred by swans; namely, large, clean, calm, and productive water bodies (Travsky et al 2004).

Non-motorized human activities, such as bird watching, photography, and other activities by pedestrians or researchers, elicit the greatest response by swans during the breeding season (*Henson and Grant 1991 in* Slater, G.L. 2006).

Although visual barriers such as vegetation and hills situated between sources of disturbance and nesting swans may serve to decrease the impact of disturbances, swans are known to respond to noises made by humans even when they were not visible (*Henson and Grant 1991 in* Slater, G.L. 2006). Wildlife viewing areas should be concealed in vegetation, designed to minimize noise of users, and located at a distance greater than 300 m from swan nests. (*Henson and Grant 1991 in* Slater, G.L. 2006) Red Rock Lakes NWR harbors the greatest nesting population in southwest Montana.

There are presently no known nesting occurrences on Forest lands, but swans do nest at Conklin Lake, a private inholding in the Gravelly landscape on the Madison RD. A comparison of nesting habitat in Elk Lake and Conklin Lake indicates that Elk Lake supports substantially more nesting habitat than Conklin Lake. Elk Lake supports an estimated 57 acres of marsh and shallow emergent vegetation, whereas Conklin Lake supports an estimated 14 acres of marsh and shallow emergent vegetation. There is also a substantial difference in lake size. At 287 acres, Elk Lake is five times the size of Conklin Lake.

Conklin Lake is actually on private land, an inholding surrounded by NFS lands. There is no public access to Conklin Lake, and human activity on Conklin Lake is minimal. However, FR 3931 parallels Conklin Lake along the entire north side at a distance of within 200 meters. A fence separates public from private land and runs between FDR 3931 and Conklin Lake.

Conversely, Elk Lake is entirely on NFS lands, hosts an active concession operation and receives moderate use by humans during the ice-free season. Forest Road 8384 parallels Elk Lake and is immediately adjacent to the lake along the southern third. The road is a substantial distance from Elk Lake on the northern end, but is immediately adjacent to the lake and borders the wetland along about 500 meters of the lake on the north end. This is the area where trumpeter swans have nested in the past. This route does provide motorized access to the north end of the lake.

Elk Lake does receive wake-creating motorized recreation during the summer months, though the current extent of this recreation appears to generally be later in the trumpeter swan breeding season when the temperature of the lake is warmer. Wake-creating speeds are generally created by larger watercraft or jet skis. As the northern end of the lake is substantially wider than the south end (specifically the “narrows” at Elk Lake resort), it is likely that wake-creating recreation would focus on the north end immediately adjacent to the lake and/or the bordering wetland along the northern 500 meters of the lake. Forest Road 8384 continues north to the Hidden Lake Trailhead.
Forest Road 8384 north from Elk Lake Resort was apparently constructed by the Forest Service in 1967 or 1968 as the primary access to Hidden Lake. The actual volume of traffic FR 8384 is variable, with the majority of vehicles not traveling north of Elk Lake. Table 24 below identifies the local distribution of Trumpter Swans based on surveys the Rocky Mountain Population, US Breeding Segment (1) USDI Fish & Wildlife Service Assessment Reports.

Table 29. Fall Trumpeter Swan Surveys

Table 29. Fall Trumpeter Swan Surveys (1)							
Site	2002	2003	2004	2005	2006	2007	2008
Conklin Lake	2 white birds 2 cygnets	2 0	2 0	2 1	2 1	2 0	0 0
Elk Lake	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Ennis Lake	1 0	0 0	0 0	0 0	4 0	3 0	4 0
Hidden Lake	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Wade Lake	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Trib to Odell Creek	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Cliff Lake	0 0	1 0	0 0	0 0	0 0	0 0	0 0

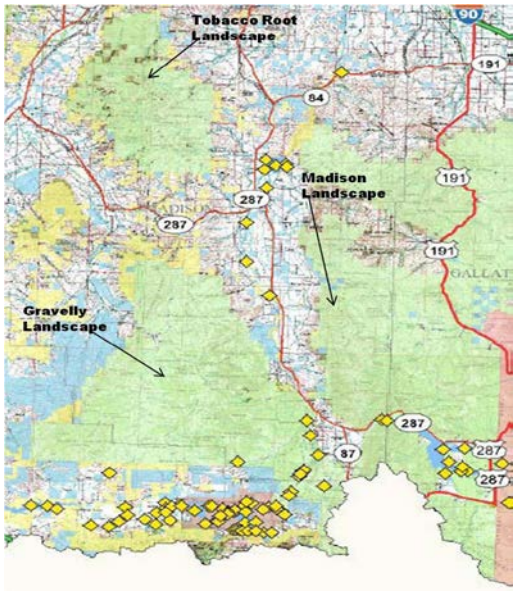

Figure 19. Madison RD area trumpeter swan detections 1990-2009. Montana Natural Heritage Tracker.

Observations by personnel from Red Rock Lakes National Wildlife Refuge (Refuge) indicate that disturbance by humans may be impacting nest success at the Elk Lake nest site. In a memo to the Forest in 2001, the Refuge pointed out that "anglers and boaters have been observed with in (sic) the Elk Lake nest territory during critical spring/early summer when swans are attempting to nest." Immediately prior to the release of the memo in early June, Refuge personnel observed that the Elk Lake nest had been abandoned but that the nesting pair had remained, and proposed closing the north end of Elk Lake during the nesting period. The Refuge memo cited the loss of historic nesting territories (as described above) on Henry's Lake and Island Park Reservoir as rationale for closing the

north end of Elk Lake to entry during the trumpeter swan nesting period.

Disturbance Effects: It is likely that human use results in disturbance that is adversely impacting nesting desirability at the Elk Lake. Nesting and winter habitat occurs in the project area. Continued use by motorized recreationists and anglers on foot at the north end of the lake during the nesting season is proposed under all alternatives. Alternatives A and C would continue to allow wake-creating speeds during the trumpeter swan breeding season, which is likely to adversely impact trumpeter swans. Alternative B and B-modified would eliminate wake-creating speeds over a 2-year period following the decision, and thus would reduce disturbance to potential nesting activity at the northern end of Elk Lake during the trumpeter swan nesting season. Alternative B and B-modified would not, however, restrict recreationists on foot or non-wake creating lake speeds in the vicinity of the historic nest territory.

Determination: Implementation of alternatives A, B and C may impact individual trumpeter swans or their habitat but will not likely result in a trend in federal listing or reduced viability. Alternatives B & B modified could provide a more favorable environment for possible swan nesting at Elk Lake, slightly expanding nesting at the southern extent of the Gravelly Landscape. Trumpeter swan population expansion in Southwest Montana has occurred within the existing footprint of multiple uses across the Madison RD, showing robust resurgence in the face of increasing human development across the Tri-State Area.

Recommendations for avoiding or minimizing adverse impacts to trumpeter swans: Monitor the historic nest area for swan presence during the early part of the breeding season. If swans return, implement an area closure to boating and fishing within 1500 feet of the nest sites between April 1 and July 15. Implement public education with signing and/or brochures.

Bald eagle (*Haliaeetus leucocephalus*)
In Montana, the bald eagle population has grown substantially since listing under the ESA. Since breeding surveys began in 1978, the bald eagle population has grown consistently both in number of pairs and number of young fledged. Populations recovered so well that the species was de-listed effective August 8, 2007 (USDI Fish & Wildlife Service 2007a).

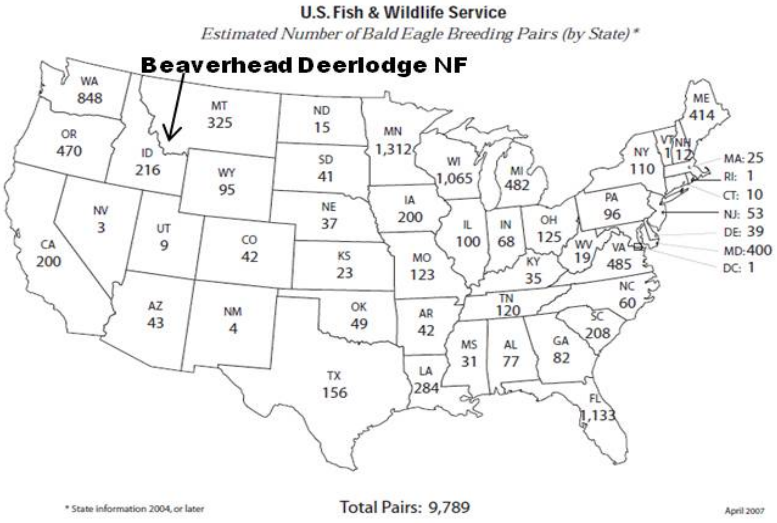

Figure 20. Bald Eagle Breeding Pairs – Conterminous US.

Management of bald eagle breeding territories may be accomplished by protecting nesting stands and feeding sites and minimizing human activities. Updated guidelines (USDI Fish & Wildlife Service 2007b) for avoiding disturbance at nest sites, foraging areas, and communal roosts are available for site specific applications depending on the type of potential disturbance.

Bald eagles nest almost exclusively in live trees usually within 1 mile and in line of sight of a large river or lake. In Montana, courtship begins in January and egg laying is initiated in early February or as late as mid-April. Alternate nest sites are typically present in the breeding area and most frequent clutch size is two (range of one to three eggs). Incubation spans 31 to 35 days and may be influenced by ambient temperatures.

Although some nesting pairs remain in Idaho, Montana, and North Dakota year-round, the winter population is generally composed of migrants from Canada (Magaddino 1989). Winter habitat is generally associated with areas of open water where fish and waterfowl congregate (Stalmaster 1987 *in* Magaddino 1989). Perching and roosting trees are typically dominant mature conifers or cottonwoods providing a good view of the area (Magaddino 1989). Bald eagles use perches during the day while hunting, feeding, or resting; roosts are used at night or for protection during inclement weather and may be occupied by one to several hundred bad eagles; roost sites, like nest sites, are used year after year (Magaddino 1989).

The bald eagle is an opportunistic predator and feeds primarily on fish, but also consumes a variety of birds and mammals (both dead and alive) when fish are scarce or these other species are readily available. Fish may comprise up to 90 percent of the diet, depending on geographic location, season, and relative abundance. Carp, suckers and salmonids are important fish species preyed on by bald eagles. Bird prey species are more important in bald eagle diets during winter when fish are less available due to ice formation on streams, lakes, and reservoirs. Waterfowl are the most common bird species preyed on by eagles. Mammals are taken at a lesser degree than fish and birds. Mammals are taken as live prey or carrion in all seasons, but become increasingly important during winter.

Local Distribution: Bald eagles currently nest along the Channels portion of the Madison River from Ennis to Ennis Lake, east of the Gravelly and Tobacco Root mountains and near Ruby Reservoir to the west of the Gravelly Mountains. There is also a bald eagle nest about 7 miles west of NFS lands in the Tobacco Root Mountains near Harrison. These nests are predominately on private land. These nests are monitored annually for occupancy and productivity.

Two other nests are within the project area. These nests are on the south east portion of the Gravelly Mountains. The Lot 87 nest overlooks the Madison River in T11S R1E S26. The Lot 87 nest is monitored annually. The Wade Lake nest is immediately to the west of Wade Lake in T12S R1E S3, and is monitored periodically. **Neither of these nests are associated with road changes that may occur with implementation of this project**.

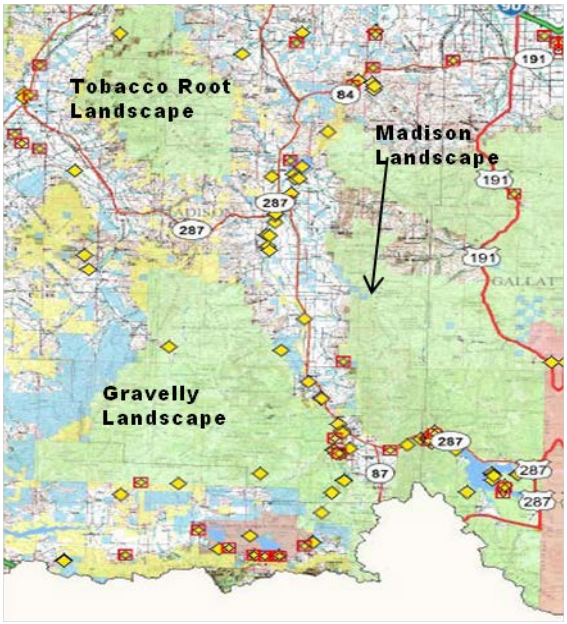

Figure 21. Madison RD area bald eagle detections. 1990-2009. Montana Natural Heritage Tracker
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Disturbance Effects: As noted in the updated management guidelines (USDI 2007b) sensitivity to human disturbance varies according to the species' nesting phases.

Nesting Bald Eagle Sensitivity to Human Activities

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested in nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the breeding season.
III	Incubation and early nestling period (up to 4 weeks)	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period, 4 to 8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements somewhat decreases. However, nestlings may miss feedings, affecting their survival.
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

Determination: Implementation of the proposed project would have few, if any direct or indirect effects on breeding, feeding or sheltering aspects of bald eagle life history. As noted under **"local distribution"** there are no nest sites associated with road changes under this project. Cumulative impacts are not anticipated. Implementation of this project is likely to have **no impact** on the bald eagle, producing no trends towards re-listing.

Recommendations for avoiding or minimizing adverse impacts to bald eagles As no impact to the bald eagle is anticipated, there are no recommendations to minimize adverse impacts to this species

from implementation of any road changes under this project.

Gray Wolf (*Canis lupus*)
"The gray wolf is the largest wild member of the dog family Canidae. Adult males average 40 to 48 kg (88 to 106 pounds) (range 20 to 80 kg (44 to 176 pounds)) whereas females average 34 to 40 kg (75 to 88 pounds) (range 18 to 57 kg (39.5 to 129.5 pounds)). Males are usually 1.5 to 2.0 meters (5 to 6.5 feet) from nose to tail tip, while females range from 1.4 to 1.8 meters (4.5 to 6 feet) in length. Most wolves stand 66 to 81 cm (2 to 2.5 feet) tall at the shoulder. About half of the wolves in Montana are black and the remainder gray. White wolves, usually older animals, are occasionally seen. Tracks are normally 11 to 14 cm (4 to 5.5 inches) long. With its long legs and deep, narrow chest, the wolf is well suited for fast and far-ranging travels" (*U.S. Fish and Wildlife Service 1987in* USDI Fish & Wildlife Service 2008).

"Gray wolves are highly social and live in packs, which are formed when male and female wolves develop a pair bond, breed and produce pups. The pack typically consists of a socially dominant breeding pair, their offspring from the previous year and new pups. Other breeding-age adults may be present, but they may or may not be related to the others. Members of the pack hunt, feed, travel and raise pups together and cooperatively. Pack size is highly variable." (USDI Fish & Wildlife Service 2008).

"The gray wolf is an opportunistic carnivore and is well adapted to hunt large prey species such asdeer, elk and moose. Wolves may scavenge carrion and even eat vegetation. Opportunistic scavenging also occurs by wolves on ungulates that are vehicle or train-killed." (USDI Fish & Wildlife Service 2008)

"Wolves die from a variety of causes either natural or human-induced. Humans are by far the largest cause of wolf mortality in the northern Rockies and the only cause that can significantly affect populations at recovery levels. Human caused mortality includes control actions to resolve conflicts, car/train collisions and legal and illegal killings." (MDFWP 2001 in USDI Fish & Wildlife Service 2008).

Local Distribution: Gray wolf packs on the Madison Ranger District were classified as non-essential/experimental when wolves were introduced into the Greater Yellowstone Ecosystem in 1995 and 1996 (USDI Fish & Wildlife Service 2008).

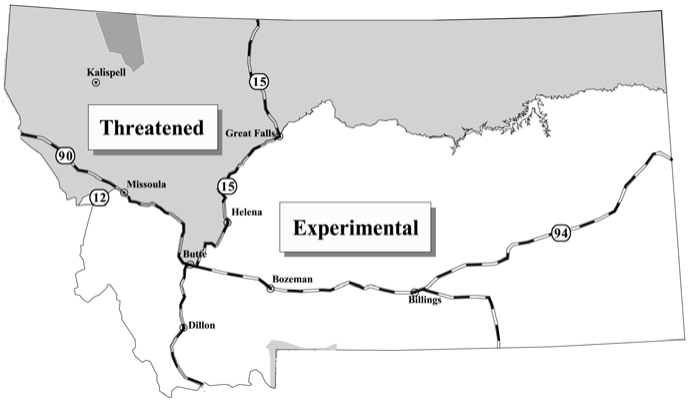


Figure 22. Montana Wolf Management Areas (USDA Forest Service 2008b).

Wolf packs have since expanded with robust pack activity located throughout the Greater Yellowstone System including the Madison Ranger District (Figure 23).

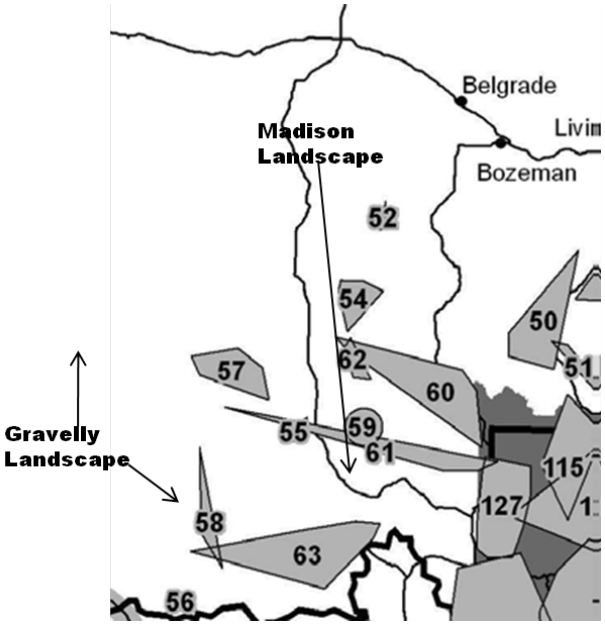


Figure 23. Wolf Packs for Madison Summer Motorized Travel Project (Sime et al. 2009).

Local Pack Activity (Sime at al 2009): References to "10j" rule pertain to classification before de-listing on May 4, 2009 (USDI Fish and Wildlife Service 2009b).

Table 30. Wolf Pack Descriptions

Pack Number	Table 30. Pack Description
54	Cedar Creek: 5 wolves; 1 radio; breeding pair no depredations reported History: New pack in 2007. It occupied a territory at the North end of the Madison range from Jack Creek to Cedar Creek. 2008 Activities: In the spring of 2007 all of the Cedar Creek pack members, with the exception of SW166F, were removed due to chronic livestock depredations. In late 2007 reports and radio monitoring flights indicated that SW166F was traveling with an un-collared black wolf. This new pair denned in the Cedar Creek area of the Madison valley and had 3 gray pups. The pups were seen numerous times during the fall hunting season and all three have advanced stages of mange.
55	Horse Creek: New pack formed in 2008. Three adults and 5 pups

Pack Number	Table 30. Pack Description
57	Jack Creek: 3+ wolves; 2 radio collars; not a breeding pair 2 calves confirmed killed History: New pack in 2008. It occupied a territory in the North end of the Gravelly and the Greenhorn mountains. 2008 Activities: On January 30th, while doing coyote control work in the north end of the Gravelly Mountains, WS darted and collared an adult male wolf (SW287M) that was traveling alone. In late February during a radio monitoring flight this was seen with an un-collared gray in the upper Ruby valley. This new pair denned in the Ruby Valley south of the Ruby Reservoir. May 6th WS investigated a calf in the lower Ruby that had bite marks on them. They concluded that the injuries were from a wolf attack, tracks of a wolf were in the area and the radio-collared wolf (SW287M) was heard nearby. The decision was for no control action at this time and the new pair wolves were monitored. On May 25th WS confirmed a dead calf as being killed by wolves in the Greenhorns south of the Ruby Reservoir near the den site. The decision was to continue to monitor the situation and not to do a control action. This decision was based on being the first confirmed depredation by these wolves and because it was only a pair with young pups in the den. Later in the summer SW287M moved back to the North end of the Gravelly Mountains and was seen with two pups but no other adults. On October 22nd while traveling back from a control action in the Centennial WS darted and collared one of the pups SW405F.No other depredations were reported and this pack did not qualify as a breeding pair.
58	Centennial: 6 wolves; 2 radio collars; breeding pair. 1 calf confirmed killed; 1 wolf removed by WS History: New pack in 2008. It occupied Freezeout's old territory of the Ruby River drainage in the Gravelly / Snowcrest Mountain range. 2008 Activities: On March 18th while doing coyote control work in the Upper Ruby WS saw a pair of wolves traveling together. They darted and collared an adult gray male wolf (SW296M). This pair of wolves denned in the Freezeout Pack's old den territory thus pushing Freezeout out of the Upper Ruby into the Blacktail drainage. On October 18th WS got a call from a producer on the NE end of the Centennial Valley that a calf had been injured. On October 21st WS looked at the calf that had died from its injuries and confirmed it as a wolf kill. It was determined that this was the territory of the new Centennial Pack and that the cattle would be in this area until approximately October 24th. MFWP authorized a control action for one, preferably, un-collared wolf. The producer was also been issued a SOS permit. On October 23rd WS removed a male pup (SW404M) from the Centennial pack and the SOS permit was cancelled and no other depredations were reported.

Pack Number	Table 30. Pack Description
59	Toadflax: 8 wolves; 2 radio collars; breeding pair no depredations reported History: New pack in 2008. It occupied a territory at the south end of the Madison Range from Beaver Creek to Indian Creek. 2008 Activities: This is a new pack that back filled this territory after the Wedge pack was removed in 2007. Three wolves showed up in the area during the early part of 2008 based on reports from area landowners. This new group of wolves used the same den area and rendezvous sites as the previous Wedge pack. Wolves were seen routinely around the den. When the wolves moved from the den they were not observed until early September when they were observed at an old rendezvous site of the Wedge pack. MFWP personnel set traps in this area, to put out a radio collar for monitoring purposes, on September 6th. Two pups were caught on September 7th and two more pups were caught on September 8th. All of the pups were processed. Two were pit tagged (SW378M & SW385M) and two were radio collared (SW377M & SW386M) with full size padded collars. No depredations were reported in this territory during 2008.
60	Cougar Creek II: border pack with YNP; counted in MT 10 plus wolves; 1 radio; not a breeding pair no depredations reported; 1 wolf killed under the 10j rule History: The Cougar Creek II pack first formed in 2001 inside YNP. Its home range was mostly inside YNP, and NPS personnel did all the monitoring. The last couple of years it has spent most of the winter outside of YNP and MFWP does most of the monitoring. 2008 Activities: During the months of January and February the Cougar II pack was observed and monitored in the Upper Madison Valley. It is suspected that they followed migrating elk from the Upper Gallatin Valley into the Madison Valley. They were observed in and around cattle during this period. On April 5th an adult female gray wolf (SW300F) was shot by a ranch hand under the 10j rule south of Ennis in the Madison Valley. It was a lone wolf that was in a group of cattle and had a newborn calf separated from the group. It was investigated by MFWP wardens and cleared as a justified action under the current 10J rules. On April 24th another rancher in the Bear Creek area reported a depredation of a newborn calf. It was investigated by WS who concluded that is was a probable wolf kill. On April 28th MFWP wardens picked up an adult gray wolf (SW313U) that was hit on HWY 191 near the Daily Creek area, which has been historically Cougar II territory. The pack then followed migrating elk back into the Upper Gallatin where it was assumed they denned. No pups were observed through the summer / fall period so they are not being considered a breeding pair. SW187M stayed in the Bear Creek area and dispersed from the pack and formed a new pack in that area of the Madison Valley called the Black Mountain pack, see write up below.
61	Hayden: border pack with YNP 6 wolves; 2 radio collars; not a breeding pair no depredations reported History: Has historically been an YNP pack; see YNP section of the Wyoming report. 2008 Activities: During a radio monitoring flight on May 5th, the Hayden pack was located in the Warmsprings Creek area of the upper Ruby River Valley. All four wolves including the two radio collars were seen from the airplane. The Hayden pack traveled around during the month of May and settled into the West Yellowstone area and the upper Gallatin Canyon and are now considered a Montana pack.

Pack Number	Table 30. Pack Description
62	Black Mountain: 5 wolves; 1 radio collar; breeding pair no depredations reported History: New pack in 2008. It occupied a territory in the Madison Range from Bear Creek to Indian Creek. 2008 Activities: This is a new pack that includes a male wolf (SW187M) that dispersed from the Cougar II pack that resides in the Gallatin Canyon. SW187M hooked up with another gray female and denned in the Bear Creek area of the upper Madison River. During the summer three pups were observed with this new pair. No depredations were reported in this new territory in 2008.
63	Horn Mountain: 5 wolves; 2 radios; breeding pair 3 calves confirmed killed; 3 wolves removed by WS History: New pack in 2008. It occupied a territory at the south end of the Madison range in the Antelope Basin area. 2008 Activities: On July 29th WS confirmed a calf as being killed by wolves. MFWP initiated a control action to remove two un-collared adults. WS took a wolf (SW358M) on July 30th and another (SW359F) on July 31st finishing the control action. On July 30th a calf was found with injuries to the hindquarters and was confirmed as done by wolves. The calf died of its injuries the following day. On October 1st WS investigated and confirmed a calf as being killed by wolves. There were three producers on the allotment; two of them moved cows home the week of September 29th and the third remained for another week. MFWP decided to initiate a control action for one wolf. On October 2nd WS finished the control action on the Horn Mountain Pack by removing a black yearling female (SW339F). Cattle were moved off of the allotment and no other depredations were reported. The Madison Valley Ranchlands Group, in collaboration with Keystone Conservation and other financial supporters, hires a range rider during the period when cattle are on the allotment. 2008 was the fifth field season of the Range Rider project in the Antelope Basin area.

Wolf numbers have been increasing in the project area in the face of the existing template of multiple use on National Forest lands and increased development on surrounding private lands. These increases are now subject to management by Montana Fish, Wildlife and Parks to include hunting. The State has instituted controlled hunting in southwest Montana with a quota of 12 animals in Management Unit 3 which encompasses the project area.

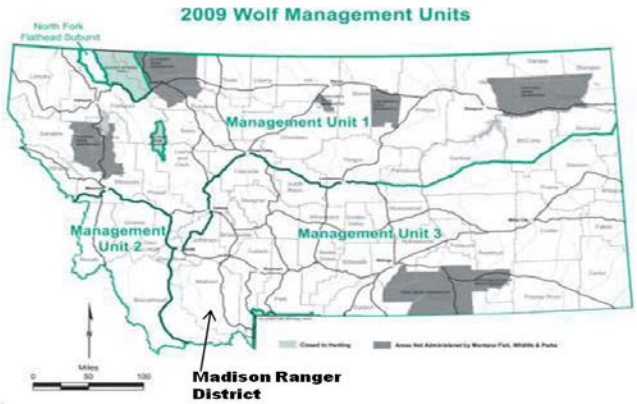


Figure 24. Wolf Management Units – Montana Fish, Wildlife & Parks 2009.

Disturbance Effects: While the wolf has been removed from the Endangered Species list effective May 4, 2009 (USDI Fish and Wildlife Service 2009b), as a Forest Service Sensitive Species disturbance effects enumerated in the Fish and Wildlife Service Biological Opinion (USDI Fish & Wildlife Service 2008) still have merit.

The Biological Opinion (USDI 2008) specifically notes: " The construction of new roads or opening previously closed roads for access may also affect wolves. Roads themselves may not prevent wolves from occupying an area as they provide easy travel. However, high road densities in an area allows human access which may potentially lead to deliberate, accidental or incidental wolf mortality, a primary source of wolf mortality (Mladenoff et al. 1999, Mech 1989, Mech et al. 1988). Frederick (1991) also found that wolves become increasingly vulnerable to human-caused mortality as access increases. As to the extent of potential mortality, Mech (1989) found that although wolves in the study area sustained unusually high human-caused mortality, the area continued to support wolves. The likely reason for this continued support was the adjacent regions consisting of low road density. However, the size of the pack was below that necessary to maintain stable populations. Areas of high road density and high human-caused mortality not located near areas of low road density may not continue to support wolves."

Both the Biological Assessment (USDA Forest Service 2008) and the Biological Opinion (USDI Fish & Wildlife Service 2008) acknowledge that lower road densities reduce mortality from vehicle collisions and reduce the potential for illegal kill of wolves from roads.

Table 32 notes that both Alternatives B, B modified, and C will reduce open motorized road and trail mileages with resulting slight increases in secure habitat. The Madison Summer Motorized Travel project is implementing reductions in road mileage that are in concert with the Forest Plan. Either Alternative B, B modified, or C will reduce road mileages which will help reduce the exposure to potential vehicle caused mortality and illegal shooting.

While the biological opinion covered the threatened portions of the species range when it was federally listed, the Fish and Wildlife Service concluded that implementing the Forest Plan "is not likely to jeopardize the continued existence of gray wolves" (USDI Fish & Wildlife Service 2008). Determination Implementation of the proposed project would have no impact on breeding, feeding or sheltering aspects of gray wolf life history and would not likely lead to relisting of the wolf. With no actions other than reductions in road mileage, no cumulative impacts are anticipated as a result of implementation of the proposed action.

Grizzly Bear (Ursus arctos horribilis)

The Forest has determined that the proposed project may impact individual bears but will not likely result in a trend in federal listing or reduced viability. The USDI Fish and Wildlife Service concurred.

Alternative Specific Effects

Potential impacts resulting from implementation of this project are addressed as a measure of road density which influences motorized disturbance to wildlife. Generally, reducing road densities improves habitat for wildlife. Secure habitat as a function of road densities is improved with any reductions in open motorized roads and trails.

With implementation of any action alternative, motorized travel on some existing routes would be curtailed. Increases in secure habitat would occur over time as travel restrictions become effective and routes where travel is no longer authorized fade from the landscape.

All action alternatives meet the Forest goal for achieving the desired summer road densities at the landscape scale (Table 31). At the Hunt District scale the action alternatives meet the Forest Plan goals for road densities at districts 311, 320, 330, 360, and 362. Districts 323, 324, 327, and 333 would be slightly over the stated goals for fall road densities at this round of planning. Hunt Districts 333 currently does not meet the objective for reducing hunting season open motorized road and trail densities, however it does meet Standard 1 (2009 Forest Plan pg. 48) for wildlife because this analysis shows no net increase in open motorized road and trail mileage in this Hunt Unit.

Table 31. Comparison of Forest Plan Motorized Route Density Goals by Landscape and Hunting District

Table 31. Comparison of Forest Plan Motorized Route Density Goals by Landscape and Hunt District Miles/sq mi to Alternatives					
Landscape Name And Hunt District Number	Forest Plan Road Density Goal mi/sq mi	Alternative A mi/sq mi	Alternative B mi/sq mi	Alternative B Modified mi/sq mi	Alternative C mi/sq mi
Gravelly	0.7	0.8	0.7	0.7	0.7
Madison	0.0	0.0	0.0	0.0	0.0
Tobacco Root	1.3	1.2	1.2	1.2	1.2
311	0.0	0.0	0.0	0.0	0.0
** 320	0.8	0.8	0.8	0.8	0.8
323	0.5	0.7	0.7	0.7	0.6
324	0.4	0.5	0.5	0.5	0.5
327	0.8	0.9	0.9	0.9	0.9
330	0.7	0.7	0.7	0.7	0.7
** 333	0.9	1.1	1.1	1.1	1.1
360	0.0	0.0	0.0	0.0	0.0
362	0.0	0.0	0.0	0.0	0.0

Table 32. Comparison of the Gravelly Landscape Secure Wildlife Habatat by Alternative

Table 32. Comparison of Gravelly Landscape Secure Wildlife Habitat By Alternative				
Forest Plan Secure Habitat Goal	Alternative A	Alternative B	Alternative B Modified	Alternative C
Gravelly Landscape - 60%	60%	61%	61%	60%

In summary, implementation of any action alternative or combination of action alternatives would result in incrementally increasing secure areas for wildlife by reducing open motorized route mileage. Changes in total open motorized routes are very similar for Alternatives B and B Modified. These changes provide for less vehicular disturbance to wildlife. As per the US Fish and Wildlife Species list (USDI Fish and Wildlife Service 2009a) for the BDNF, the grizzly bear is the only ESA listed species to consider for this project. A biological assessment is in preparation since the Yellowstone Distinct Grizzly Bear Population segment's relisting in September, 2009. By simply reducing the existing template of motorized routes with no vegetation treatment proposed, the action alternatives will not affect the grizzly bears on the Madison RD. Secure habitat for the grizzly bear will be maintained across the range of alternatives with both alternatives B and B Modified providing a slight increase in percent secure habitat (Table 32).

Alternative A, No Action

Alternative A represents the existing open motorized routes within the Gravelly and Tobacco Root Landscapes. This alternative would close the least amount of open motorized routes. There will be no change in road mileage, percent secure habitat, or movement towards desired condition for road densities.

Alternative B, Proposed Action, and Alternative B Modified

Table 33 shows that Alternatives B and B Modified, would reduce the total number of miles of summer open motorized routes in the Gravelly and Tobacco Root landscapes by approximately 35 and 36 miles respectively. Table 34 also shows that the Hunt Districts would see a reduction of 20 miles in fall open motorized route mileage for both alternatives.

Table 33. Total Miles of Motorized Routes by Landscape and Hunt Unit by Alternative

Table 33. Total Miles of Motorized Routes By Alternative				
Landscape Name and Unt District Number	Alternative A	Alternative B	Alternative B-Modified	Alternative C
Gravelly Landscape	559.0	539.6	537.2	549.0
Madison Landscape	0.6	0.6	0.6	0.6
*Tobacco Roots Landscape	358.6	342.7	343.8	353.3
Landscape Subtotal	**918.0**	**883.0**	**882.0**	**903.0**
311	0.0	0.0	0.0	0.0
320**	112.0	112.9	112.9	111.7
323	102.4	102.4	102.4	100.7
324	140.7	132.9	130.2	138.5
327	177.5	172.4	172.4	174.2
330	79.9	73.5	74.9	79.4
333**	179.1	177.0	178.8	178.5
360	0.5	0.5	0.5	0.5
362	0.1	0.1	0.1	0.1
Hunt District Subtotal	792	772	772	784

*Tobacco Roots includes the Jefferson RD portion of the landscape which includes 116 route miles

** Hunting districts 320 & 333 include the Jefferson RD portions

Table 34. Motorized Route Densities by Landscape and Hunting District

Table 34. Motorized Route Densities by Landscape and Hunting District Miles/sq mi				
Landscape Name and Hunt District numbers	Alternative A mi/sq mi	Alternative B mi/sq mi	Alternative B Modified mi/sq mi	Alternative C mi/sq mi
Gravelly	0.8	0.7	0.7	0.7
Madison	0.0	0.0	0.0	0.0
*Tobacco Root	1.2	1.2	1.2	1.2
Landscape Sub Total	0.7	0.7	0.7	0.7
311	0.0	0.0	0.0	0.0
320**	0.8	0.8	0.8	0.8
323	0.7	0.7	0.7	0.6
324	0.5	0.5	0.5	0.5
327	0.9	0.9	0.9	0.9
330	0.7	0.7	0.7	0.7

Table 34. Motorized Route Densities by Landscape and Hunting District Miles/sq mi				
Landscape Name and Hunt District numbers	Alternative A mi/sq mi	Alternative B mi/sq mi	Alternative B Modified mi/sq mi	Alternative C mi/sq mi
333**	1.1	1.1	1.1	1.1
360	0.0	0.0	0.0	0.0
362	0.0	0.0	0.0	0.0
Hunt District Subtotal	0.6	0.6	0.6	0.6

*Tobacco Roots includes the Jefferson RD portion of the landscape which contains 116 route miles.
** Hunting districts 320 & 333 include the Jefferson RD portions

Direct and Indirect Effects:
There would be a Summer reduction of 35 miles of open motorized roads and trails with the majority (19.4 miles) in the Gravelly Landscape (BE Table 2). Secure habitat increases by 1% in the Gravelly Landscape and Tobacco Roots landscape. Hunt Unit road mileage in the Gravelly Landscape would be reduced by an additional 7.7 miles over the existing condition. Changes in road mileage are too small to affect road densities. Potential motorized disturbance to wildlife would decrease because of net decrease in mileage.

Cumulative Effects:
Increases in secure habitat over time would occur as travel restrictions become effective and routes where travel is no longer authorized fade from the landscape. Secure habitat for grizzly bears and potential connectivity for ungulates and large carnivores would improve with the additional closure of 32.9 miles as a result of the implementation of ROD2.

This alternative would provide more summer security and less road density at the landscape scale, thereby meeting the desired Forest Plan condition for both the Gravelly and Madison landscapes. This would constitute an improvement over the desired condition for the Tobacco Roots landscape. Hunt District road densities would not exceed the existing condition, but would be slightly above the desired condition for units 323, 324, 327, 333 (Table 31). Hunt District 333 currently does not meet the objective for reducing the open motorized road and trail densities, however it does meet Standard 1 (2009 Forest Plan pg. 48) for wildlife because this analysis shows no net increase in open motorized road and trail mileage in this Hunt Unit.

Alternative C

Alternative C represents a middle ground between alternatives A, B, and B-modified. Alternative C would reduce the total number of miles of open motorized routes on the Gravelly and Tobacco Root landscapes by approximately 15.0 miles.

Direct and Indirect Effects:
Alternative C reduces summer road mileage by approximately 15.3 miles and maintains percent secure habitat across all three landscapes (Table 1, BE). Although open motorized route mileages are reduced at both the landscape and hunting unit scales, there is no measurable change in secure habitat over the existing condition (Tables 1 & 2, BE)

Reductions in open motorized routes would reduce potential disturbance to wildlife.

Cumulative Effects:
Increases in secure habitat over time would occur as travel restrictions become effective and routes where travel is no longer authorized fade from the landscape. Secure habitat for grizzly bears and potential connectivity for ungulates and large carnivores would improve with the additional closure of 32.9 miles as a result of the implementation of ROD2.

Soils

Existing Condition

Introduction

The Region 1 soil quality standards apply to lands where vegetation and water resource management are the principal objectives, that is, timber sales, grazing pastures or allotments, wildlife habitat, and riparian areas (USDA Forest Service, 1999). Roads and trails are a "dedicated use" for lands that comprise the road prism and right of way. The affected land is managed for transportation uses and is not managed for vegetation production or water resources. Therefore, the R1 soil quality standards do not apply to this analysis. However, the decision made in this project will affect the amount of land in the productive soil base if one of the action alternatives is selected.

Existing Condition:

The geology, landforms, and soils for the project area are described in Table 30 below in broad terms, using subsection descriptions (Nesser et al., 1997). Subsections were mapped at a 1:500,000 scale, and are described as smaller areas of sections with similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities (ECOMAP, 1993). Each subsection has landscape components that differentiate it from adjacent subsections. The criteria used to develop the Subsection map include geologic materials, geomorphic features, and climate. Other components known as "accessory characteristics" such as soils and vegetation were used to describe each subsection but are not used to delineate the units.

This project area is covered by the Gravelly, Madison, and Ruby/Tobacco Roots Subsections. Because the majority of the Madison Subsection is covered by Wilderness and Recommended Wilderness, there are few changes to the soil resource from management activities. The one activity that does continue is livestock grazing. Although there is evidence of trailing, there are no other identifiable conditions that can be associated with grazing in the Madison Subsection.

Subsection: **Gravely Mountain**
Geology - Shale, siltstone, sandstone, and a variety of deposited materials.
L*andforms* - Block faulted mountains.
Climate - Mean annual precipitation ranges from 14 to 40 inches, with about 60 percent falling as snow.
Soils - Deep, clay loams and clays at lower and intermediate elevations in the Ruby River and West Fork Madison River drainages. Productivity is moderate and high and susceptible to mass wasting, erosion, puddling and compaction. Other soils are shallow to deep gravelly, cobbly and stony loams and sandy loams. Productivity is low on shallow soils and moderate elsewhere. These soils are also resistant or moderately susceptible to erosion.
Other Characteristics - The landscape has been modified by glaciation and mass wasting. Elevations range from 5,800 to 10,600 feet. Drainage density is moderate to high.

Subsection: **Madison**
Geology - Formed predominantly in gneiss and sedimentary rock with small areas of volcanic rock.
L*andforms* - Steep mountains.
Climate – Mean annual precipitation ranges from 20 to 60 inches, with about 65 percent falling as snow.
Soils – Shallow to deep, cobbly, and very cobbly sandy loams and loams. Productivity is low and moderate. These soils are generally resistant to erosion and other soil impacts.

Other Characteristics - The landscape has been modified by alpine glaciation. Elevations range from 7,500 to 11,200 feet. Drainage density is moderate. Lakes occur in the high elevation cirque basins.

Subsection: **Ruby/Tobacco Roots**
Geology – Formed mostly in gneiss with smaller areas of quartzite, granite, shale, sandstone and limestone.
L*andforms* – Block faulted mountains.
Climate – Mean annual precipitation ranges from 13 to 45 inches, with about 60 percent falling as snow.
Soils – Soils are shallow to deep, cobbly and very cobbly sandy loams and loams. Productivity is low and moderate and soils are generally resistant to erosion and other soil impacts.
Other Characteristics - Alpine glaciation has modified much of the landscape. Elevations range from 5,000 to 10,600 feet. Drainage density is moderate to high.

There are acres throughout the project where the vegetative cover has not returned in sufficient amount to eliminate all surface erosion for activities such as mining, grazing, or vegetation management.

Desired Condition:

As outlined in the 2009 Beaverhead-Deerlodge NF Forest Plan (2009 Forest Plan), the Goal for the soil resource is stated as, “Soil productivity is maintained or restored”. Designated roads and trails are not included as the productive land base. They are considered a “dedicated use”. Offsite effects to soil productivity as a result of runoff and erosion from roads do occur, but the effects are usually localized and very minor. Offsite effects can be minimized by appropriate use of BMPs.

Effects Analysis

Resource Factors to be Analyzed and Units of Measure:
Miles of proposed additions of unauthorized roads and trails to the Forest transportation system are compared among the alternatives. These areas would be removed from the productive soil base, though it is important to note that soil productivity and function was affected at the time when the unauthorized road or trail was created.

Miles of proposed system and unauthorized road and trail closures are compared among the alternatives, as they represent potential gains in soil productivity over the long term (20-40) years and beyond, from the time of closure to motorized activity. See section below for more information on timeframes for recovery in soil productivity.

Changes in down slope, offsite effects in the form of erosion from roads and trails affecting offsite, down slope soil productivity will not be used. The impacts from routes are usually small and localized. None of the alternatives is expected to produce enough erosion to result in any measurable change in surface erosion alone or cumulatively.

Since there would be no change to existing road/trail prisms, and no new construction of roads or trails, no measurable change in soil hydrologic function is expected with any of the alternatives.

Conceptually, changes in season of use and changes in designation from roads to trails as proposed in Alternative B and Alternative B Modified could result in changes in downslope, offsite effects in the form of erosion from roads and trails affecting offsite, downslope soil productivity; however, these impacts are usually very small and localized, and implementation of any of the alternatives would not

likely result in any measurable changes. As the hydrology section details, the most important factors affecting sedimentation from roads include the following:

- Surface width of the route and the amount of exposed soil
- Slope of the route and the distance water can travel along its surface
- The geology of the area and soils comprising the route surface
- Surrounding Topography – i.e. the steepness of adjacent slopes
- Precipitation Patterns
- Vegetative characteristics of adjacent riparian areas
- The Frequency that route maintenance occurs
- How route maintenance is implemented

Factors that have relatively less influence include:

- Vehicle type
- Traffic level (intensity)
- Season of use

Analysis Method/Basis of Analysis

Roads and trails are considered an irretrievable commitment of soil productivity during the lifespan of the road or trail. Unauthorized routes are not considered a dedicated use and impact the productive soil base. Designating routes that are currently unauthorized will involve removing the area they cover from the productive soil base. It is important to note, however, that the actual effects to soil productivity occurred at the time the route was created. The addition of unauthorized routes in most instances within the analysis area means a continuation of what is currently occurring.

While currently authorized routes that would be closed as a part of the action alternatives could experience some degree of revegetation in the form of grasses and herbaceous vegetation, improvements in soil productivity within a 10 to 15-year timeframe likely would not be substantial if mitigative measures such as decompaction and seeding of the road surface are not performed. If roads remain closed to motorized use beyond this timeframe, improvements in soil productivity (as judged by the vegetative community colonizing the road/trail surface) would be expected to be more dramatic. These timeframes are based on personal observations and those of Dave Ruppert, Forest Soil Scientist, of road surface recovery after closure to motorized use in various locations across the forest (Dave Ruppert, personal communication, November 2, 2009). If, however, mitigative measures such as decompaction of the road/trail surface are performed, recovery would be expected to occur over a shorter time period, since compaction is usually a limiting factor in establishing vegetation and can take 20-40 years or longer to recover from compaction naturally, depending on the site. Kolka and Smidt (2004) found that subsoiling roads (to treat compaction) as a method of decommissioning resulted in significantly greater white pine diameter growth and yellow-poplar height and diameter growth than the control treatment (planting cover crops) after two years.

Management Activities Affecting Soils

Maintenance of soil productivity is the desired condition for soils. This is reflected in NFMA and the forest plan, among other direction (see desired condition above). Potential impacts to soil productivity from management activities include displacement, compaction, erosion, rutting, puddling, loss of organic matter, and mass wasting. Management effects on soils are primarily restricted to the site in question. Therefore, the spatial scope for effects is the soil directly beneath any activity, with associated down-slope areas.

Historic activities that have occurred in the project area are livestock grazing, vegetation

management, mining, recreation, and road building. Livestock grazing, mining, and recreation continue in the project area currently.

Livestock grazing began in the early 1900's. A total of 675,000 acres has been grazed in the past, with much of the acreage still being grazed currently. Livestock grazing that meets grazing standards designed to maintain or improve forage production will provide the vegetative protection to maintain and improve soil production. Local exceptions will always exist on heavily used areas such as trails, salt grounds and water developments. These areas normally have bare, compacted soil and erosion which contribute to productivity reductions on small areas within range allotments. Some areas, still recovering from past heavy grazing, have additional areas of disturbance where vegetation is inadequate to protect the soil. Cattle tend to congregate throughout allotments and cause effects that, while not as obvious as described above, increase the risk of erosion.

Soil effects from minerals management consists of disturbance from roads, drill pads, mines, and developments associated with these activities. The scale of impact varies considerably by activity. Exploratory drilling for locatable minerals can involve no more than a short temporary road and a very small pad open for a short time and rehabilitated. Soil productivity impacts are generally very low to non-existent, and very site specific in nature. Effects from minerals management occur where these activities disturb the soil, and in small, localized areas where waste rock and tailings from mining activity contain phytotoxic concentrations of metals.

Timber harvest has occurred historically on the Madison district and was primarily related to development of towns and ranches. Harvested stands have since regenerated, and minimal timber harvest is currently ongoing. Effects on soils from timber harvest are generally from equipment used for harvest, yarding, and site preparation and slash disposal activities and from roads and skid trails. The risk for erosion is highest from roads and skid trails because they expose more bare soil and have the potential to concentrate runoff, thereby increasing the erosive force of runoff.

Prescribed fire for fuel reduction and vegetation management has occurred during the past decade and continues today. Prescribed burns have not likely caused detrimental soil disturbance since burns are planned in the spring and fall to prevent effects from intense soil heating. Also, the area burned is typically relatively small and produces a mosaic of unburned to moderately burned surfaces with little potential for erosion. These burns have the potential to prevent undesired long term soil effects from intense soil heating and from exposing large areas to soil erosion as a result of wildfire in areas with excessive fuel loads.

Fire is a natural process in all ecosystems on the Madison Ranger District. Soils and landforms reflect effects from past wildfires to varying degrees. Wildfire, by definition, is uncontrolled in terms of timing, intensity, and extent. Soil effects from wildfire are variable but the pattern usually leaves a mosaic of large areas of benign effects with small areas of damage from intense soil heating. Large areas can be exposed to erosion for varying time periods because the protective cover of vegetation, duff and litter are consumed.

Recreational and transportation developments such as campgrounds, roads and trails remove areas from the productive soil base. Soil productivity impacts are accepted as a trade-off for the desirable attributes of the facilities. However, soil productivity for campgrounds is still desired in order to maintain the vegetative environment that adds to the recreational experience even though soil productivity reductions are inevitable, due to compaction and/or displacement of soils associated with intensive use. These facilities affect small areas intensively managed to maintain the natural vegetative community and prevent erosion and sediment production.
Roads and trails are more extensive; they have the potential to produce on- and off-site impacts on the

productive soil base; and they vary from high standard low impact to low standard high impact. The effects of building and subsequent use of roads and trails to the soil resource are fairly well known and documented (e.g. Gucinski et al., 2001). See the "Effects Common to all Alternatives" section below for more discussion about the effects of roads on soils.

Effects Common to all Alternatives

The effects of building and subsequent use of roads and trails to the soil resource are fairly well known and documented (e.g. Gucinski et al., 2001). These generally include removal of vegetation, compaction and rutting, which result in breakdown and deformation of soil structure, and subsequent erosion. Roads can cause slope failures, particularly in areas with fine textured soils and water tables near the soil surface. Road cuts and fills are more susceptible to erosion and produce more runoff than adjacent undisturbed soil. These attributes, if uncontrolled, have the potential to erode soil on site and off site and to deposit eroded material on soil below roads and trails. This effect is usually localized. High standard roads and trails (properly located with adequate drainage and surfacing, and with vegetated cuts and fills) have few soil effects other than on the travel way. Low standard roads and trails (many are user created) can be poorly located, have inadequate drainage and un-vegetated cuts and fills. They have the attributes described in the previous paragraph and can produce soil impacts below roads and trails. In general, roads and trails closed to motorized use have a lower risk of erosion than those with motorized use because less bare soil is exposed and is subject to much less mechanical disturbance. Long-term accelerated erosion tends to continue on roads in direct proportion to traffic use (p. 67, Seyedbagheri, 1996).

Very minor and localized effects to the productive soil base, such as deposition of eroded road or trail surface material on downslope locations would continue, depending on the maintenance level of the road or trail in question, and also the level of use of the road or trail. Application of appropriate BMPs would reduce the potential for eroded road/trail material to affect offsite, downslope soil productivity.

Since there would be no change to existing road/trail prisms, and no new construction of roads or trails, no measurable change in soil hydrologic function is expected with any of the alternatives.

No Action Alternative – Alternative A

Direct Effects:

Direct effects are those that are caused by an action and occur at the same time and place. Direct effects to the soil resource are occurring on the 15.3 miles of unauthorized roads and trails that are currently open to motorized use. Since these roads and trails are unauthorized, they are not a "dedicated use" as system roads are, and therefore are considered to have a negative impact on soil productivity.

Indirect Effects:

Indirect effects are those that are caused by an action and occur later in time and/or are separated by distance. The no action alternative proposes no new actions in the project area; indirect effects associated with the no action alternative are those that are already occurring as a result of the roads and trails in the project area, and maintenance activities associated with the roads and trails.

Currently, there are 707.2 miles of existing system and unauthorized roads and trails that are closed to motorized activity. That represents a full 47% of the entire road and trail system on the Madison Ranger District. On these 707.1 miles, small gains in soil productivity will continue to occur over time as the soil recovers and vegetation begins to colonize the road and trail surfaces. The amount of recovery realized is expected to be highly variable across sites and is dependent upon several factors, including the amount of time the road or trail has been closed to motorized use, current level and

type(s) of non-motorized use, inherent productivity of the road/trail surface material, road/trail grade, habitat type and climate. Whether the route is a road or trail will also help dictate the amount of recovery; for example, a road that is closed to motorized use is likely wider than a trail that is closed to motorized use, leaving more surface area to recover, depending upon the amount of current use the road or trail receives.

Currently, 277.4, or 94.8%, of the existing 292.7 miles of unauthorized roads and trails on the Madison Ranger District are already closed to motorized activity.

Cumulative Effects:
Cumulative effects to the soil resource occur when past, present, or reasonably foreseeable activities overlap in both time and space with the proposed activities. This means that cumulative effects would be limited spatially to the areas that the proposed activities would occur that have also had effects from previous management activities or are expected to have effects from future management activities. The spatial scope for effects is the soil directly beneath any activity, with associated down-slope areas. Grazing is an ongoing activity in the project area that has the potential to affect soil productivity on those roads and trails currently closed to motorized activity that have recovered sufficiently to support vegetation. Continued grazing in the area may impede vegetation establishment on roads and trails that are closed or obliterated.

The 2009 Forest Plan ROD 2 decision closed 32.9 miles of roads and trails. Gains in productivity over time on these routes may occur as described in the Analysis Method/Basis of Analysis section above.

Proposed Action Alternative – Alternative B

Direct Effects:
Direct effects are those that are caused by an action and occur at the same time and place. The addition of 12.1 miles of currently unauthorized routes to the system represents a direct effect to the soil resource, since these areas would no longer be considered part of the productive soil base. This is an administrative distinction, as the greatest on-the-ground effects to the soil resource occurred at the time the unauthorized route was created, and continued with use of the route. No miles of unauthorized routes will be open to motorized use under this alternative; they are all either added to the system or closed.

Indirect Effects:
Indirect effects are those that are caused by an action and occur later in time and/or are separated by distance. The proposed action would result in indirect effects as changes in the motorized status of roads and trails would take time to be reflected in the soil resource.

This alternative would have the second greatest impact on the soil resource of the action alternatives. All action alternatives propose small changes when analyzed in context of the entire road and trail system on the Madison Ranger District. This alternative would result in the closure of 32.8 miles of system roads and trails, 4.2 of which would be decommissioned. With the exclusion of motorized traffic, these 32.8 miles should begin to revegetate and gain improvements in soil productivity over time. The closure of 3.3 miles of unauthorized roads should also experience improvements in soil productivity over time. These areas proposed for closure comprise a very small percentage of the project area; about 4.5% of the total motorized road mileage (including both authorized and unauthorized) in the project area when both authorized and unauthorized routes proposed for closure or obliteration are considered.

Cumulative Effects:
Cumulative effects to the soil resource occur when past, present, or reasonably foreseeable activities overlap in both time and space with the proposed activities. This means that cumulative effects would be limited spatially to the areas that the proposed activities would occur that have also had effects from previous management activities or are expected to have effects from future management activities. Most soil impacts occur only when and where the soil is directly disturbed. The exception is where runoff from a disturbed site may cause erosion and deposition at a site lower on the hillslope. Therefore, the spatial scope for effects is the soil directly beneath any activity, with associated down-slope areas.

With regard to past, present, and reasonably foreseeable cumulative effects to soils, grazing is overlaps in time and space with the proposed action. Continued grazing in the area may impede vegetation establishment on roads and trails that are closed or obliterated.

The 2009 Forest Plan ROD 2 decision included closing 32.9 miles of roads and trails. Gains in productivity over time on these routes may occur as described in the Analysis Method/Basis of Analysis section above.

Alternative B Modified
Direct Effects:
Direct effects are those that are caused by an action and occur at the same time and place. The addition of 12.1 miles of currently unauthorized routes to the system represents a direct effect to the soil resource, since these areas would no longer be considered part of the productive soil base. This is an administrative distinction, as the greatest on-the-ground effects to the soil resource occurred at the time the unauthorized route was created, and continued with use of the route. No miles of unauthorized routes will be open to motorized use under this alternative; they are all either added to the system or closed.

Indirect Effects:
Indirect effects are those that are caused by an action and occur later in time and/or are separated by distance. The proposed action would result in indirect effects as changes in the motorized status of roads and trails would take time to be reflected in the soil resource.

This alternative would have the greatest impact on the soil resource of the action alternatives. This alternative would result in the closure of 36.1 miles of system roads and trails, 4.2 of which would be decommissioned. With the exclusion of motorized traffic, these 36.1 miles should begin to revegetate and gain improvements in soil productivity over time. The closure of 3.4 miles of unauthorized roads should also experience improvements of productivity over time. These areas proposed for closure comprise a very small percentage of the project area; about 4.5% of the total motorized road mileage (including both authorized and unauthorized) in the project area when both authorized and unauthorized routes proposed for closure or obliteration are considered.

Cumulative Effects:
Cumulative effects to the soil resource occur when past, present, or reasonably foreseeable activities overlap in both time and space with the proposed activities. This means that cumulative effects would be limited spatially to the areas that the proposed activities would occur that have also had effects from previous management activities or are expected to have effects from future management activities. Most soil impacts occur only when and where the soil is directly disturbed. The exception is where runoff from a disturbed site may cause erosion and deposition at a site lower on the hillslope. Therefore, the spatial scope for effects is the soil directly beneath any activity, with associated down-slope areas.

With regard to past, present, and reasonably foreseeable cumulative effects to soils, grazing is overlaps in time and space with the proposed action. Continued grazing in the area may impede vegetation establishment on roads and trails that are closed or obliterated.

The 2009 Forest Plan ROD 2 decision included closing 32.9 miles of roads and trails. Gains in productivity over time on these routes may occur as described in the Analysis Method/Basis of Analysis section above.

Alternative C

Direct Effects:
Direct effects are those that are caused by an action and occur at the same time and place. There are no direct effects of Alternative C to the soil resource, since no unauthorized routes would be added to the designated system of roads and trails. Effects of closing unauthorized routes are discussed in Indirect Effects, below, since potential gains in soil productivity would occur later in time after the roads/trails were closed to motorized activity.

Indirect Effects:
Indirect effects are those that are caused by an action and occur later in time and/or are separated by distance. Alternative C proposes very small changes to the existing condition. In total, all unauthorized routes, 15.3 miles (1.9% of the total road mileage in the project area) are proposed for closure. A full 98.1% of the existing motorized road use would remain the same as it is now. With the exclusion of motorized traffic, the 15.3 miles proposed for closure should begin to revegetate and gain improvements in soil productivity over time.

Cumulative Effects
Cumulative effects to the soil resource occur when past, present, or reasonably foreseeable activities overlap in both time and space with the proposed activities. This means that cumulative effects would be limited spatially to the areas that the proposed activities would occur that have also had effects from previous management activities or are expected to have effects from future management activities. The spatial scope for effects is the soil directly beneath any activity, with associated down-slope areas.

With regard to past, present, and reasonably foreseeable cumulative effects to soils, grazing is overlaps in time and space with the proposed action. Continued grazing in the area may impede vegetation reestablishing on roads and trails that are closed or obliterated.

The 2009 Forest Plan ROD 2 decision included closing 32.9 miles of roads and trails. Gains in productivity over time on these routes may occur as described in the Analysis Method/Basis of Analysis section above.

Comparison of Alternatives:
When all unauthorized and system roads proposed for closure are combined together, Alternative B and B Modified are virtually identical (Alternative B closes one tenth of a mile more than Alternative B Modified) and would close the most miles, and would therefore have the greatest potential to add acres to the productive soil base over time. Alternative C would close the least number of miles of the action alternatives. Alternative A would close the least system roads and trails, and would have the least potential to add acres to the productive soil base over time.

Alternative B and Alternative B Modified would add the most unauthorized roads and trails to the system at 12.1 miles for both alternatives. These miles would be taken out of the productive soil base, though it is important to note that the on-the-ground effects to soil productivity occurred at the

time the routes were created.

All action alternatives would result in an improvement over the no action alternative in regards to the Forest Plan goal of maintaining or restoring soil productivity. The Forest Plan Standards do not apply to this analysis, as they are the Regional Soil Quality Standards which do not apply to this analysis (see Regional Direction, above in the introduction).

Aquatics

Existing Condition

There are 887 miles of perennial stream on NF lands within the analysis area (Table 35). Nearly half of these are fishless. Approximately 309 miles (35%) of perennial stream miles are within 300 feet of a road or trail.

Trout fisheries within the analysis area include westslope cutthroat trout, fluvial arctic grayling, rainbow trout and eastern brook trout. Amphibian species include the columbia spotted frog, western (boreal) toad, boreal chorus frog, and tiger salamander. Approximately 39 of the 79 miles of stream (49%) supporting conservation westslope cutthroat trout populations (WCT) are within 300 feet of a road or trail. Thirteen miles of stream supporting fluvial arctic grayling are within 300 feet of a road or trail.

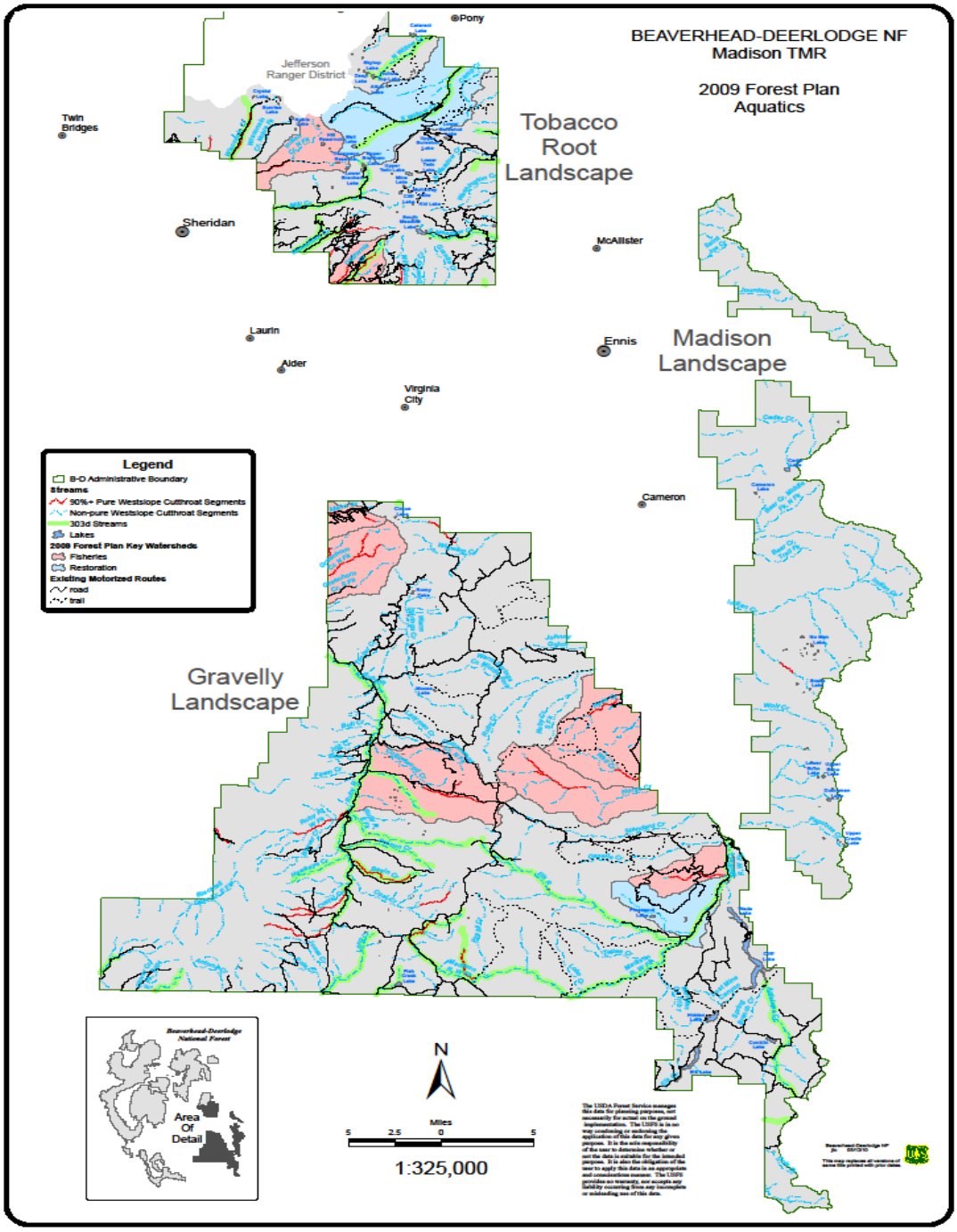
Figure 25 below displays the analysis area for cutthroat and non-cutthroat streams along with water quality limited streams (303-d), fisheries and restoration key watersheds and existing motorized routes.

Table 35. Miles of stream with Conservation Cutthroat, Non-Conservation Cutthroat, Fluvial Arctic Grayling and other types of fisheries and their occurrence within 300 feet of a road or trail.

Stream/Fishery	Miles
Perennial stream	887.1
Perennial stream within 300' of road or trail	308.6
Conservation WCT stream	78.7
Conservation WCT stream within 300' of road or trail	38.9
Non-conservation WCT stream	119.6
Non-conservation WCT stream within 300' of a road or trail	39.4
Fluvial Arctic grayling stream*	30.0
Fluvial Arctic grayling stream w/in 300' of a road or trail	13.0
Non-WCT stream	248.3
Non-WCT stream within 300' of a road or trail	93.6
Miles of perennial fishless stream	440.4
Miles of fishless stream within 300' of a road or trail	136.8

* - stream miles reported for fluvial Arctic grayling are a subset of those reported under non-WCT fish

Figure 25. Cutthroat streams, 303d Streams, and Fish and Restoration Key Watersheds



Effects Analysis

Analysis and Inherent Assumptions

The decision being made is administrative and does not influence the current road and trail infrastructure. All roads and trails will remain in place until subsequent NEPA is completed to modify conditions on the ground (i.e. to obliterate, rip and seed, etc.). As such, this analysis simply considers where there are changes in the season and/or type of motorized use.

Traffic intensity on routes that remain open to travel is not regulated through this decision. While traffic intensity may change as a result of changes in recreational preferences, they are largely unpredictable. As such, in this analysis changes in traffic intensity are only considered for routes that become non-motorized.

Most unauthorized routes and dispersed access roads are currently open for motorized use. Thus, for this analysis adding them to the transportation system is essentially an administrative decision, and is assumed to result in no change from current use, unless there is a change in the season of use.

Direct effects to fish and aquatic habitat, from the alternatives, are considered to occur when vehicles are physically changing habitat or crushing fish and/or amphibians. The potential for this to occur is limited to unimproved route crossings (fords). Fords are a relatively rare occurrence on perennial channels (estimated to represent less than one percent of the crossings) on FS lands within the project area, as all but a handful of crossings have been improved with culverts or bridges. Even if all crossings (427) on perennial streams were fords and 25 feet of disturbance occurred at each one, the total length of stream impacted would amount to only 0.0023 (2 tenths of one percent) of the 887 miles of perennial stream on NF lands in the analysis area. Thus, direct effects to habitat from these alternatives are inconsequential.

While mortality to eggs or fish from motorized vehicles is possible, it is likely to occur very infrequently, and in isolated areas. When one considers the natural instincts of fish are to flee upon approach and that it can only occur at fords where vehicles actually enter the water, there is little potential for measurable effects to populations.

Direct mortality to amphibians can occur at fords and other places along the route. Based on the elevation of National Forest lands in the analysis area, and life histories of various native amphibians, risk would be greatest for the western toad, an R1 sensitive species that tends to migrate greater distances overland in summer than other native amphibians (Bartelt 2000).

At fords, the potential for toad mortality is substantially limited, for the same reasons noted for fish above. When one considers the percentage of overall habitat that fords represent, and toads' tendency to move from disturbance, mortality in those sites is likely low and inconsequential. It may occur occasionally, but not at a frequency that is likely to influence populations. This is supported by the lack of documented mortality at these sites.

Because toads can travel considerable distances overland, the potential for vehicle mortality away from fords expands the area of consideration. To date, most studies conducted on amphibian road mortality - toads in particular - have been in Europe. North American studies exist but generally are less focused on toads or anurans as a group. Most of the European studies appear to have been on paved roads with high traffic intensities and vehicle velocities. Van Gelder (1973) found high mortality on an asphalt-paved road that toads were crossing to access breeding habitat in the Netherlands. This 4m wide road had traffic rates of 336 cars/day, and unreported speed limits. That situation differs substantially from the low intensity (average about 40 vehicles/day on the more commonly traveled roads) (C. Simonsen BDNF Transportation Engineer), and low vehicle velocities

(10 to 35 mph) common to gravel surfaced roads in the analysis area.

Puky (2003) also documented substantial toad mortality on a dike as toads dispersed from the Danube River. He noted traffic intensities closer to our higher use roads of five cars / hr. However, we are not seeing notable levels of mortality within the analysis area. On the Madison District, the two best examples of "high use" roads or trails (albeit low traffic volumes and speeds as compared to available published studies) potentially bisecting a breeding western toad population is in the upper Ruby River basin, and also near Crockett Lake. In both cases, observations of the toad populations over the last five years indicate they are strong and healthy, with no reports of high road mortality that could impact population viability. This suggests the threat of traffic mortality to toads in this project area is quite low.

Differences in what was observed on the Danube and what occurs within the analysis area are difficult to know. However, some of the differences are likely to be behavioral. Toads need to be on the roadway at the same time as the cars, for mortality to occur. Schmetterling and Young (2008) found that toad movements tended to be more common during the night. On most of our motorized routes, traffic intensities tend to decline substantially. In many cases, traffic rates probably approach levels substantially below 1 vehicle per hour.

Table 36 compares Alternatives regarding the proximity of motorized routes to known toad breeding locations within the analysis area. There is no difference between Alternatives A, B and B Modified. Alternative C would result in reductions of 0.2, 0.3, 0.5 and 0.6 miles respectively, of motorized routes within 50, 100 400 and 800 meters of breeding sites. Reductions in the length of motorized route near breeding sites, in Alternative C are unlikely to result in notable changes in vehicle related mortality, primarily because mortality from motorized traffic is minimal near all known breeding areas within the analysis area.

Table 36. Total miles of motorized road or trail within various distances of known BUBO

	Miles of Motorized Route Near Toad Breeding Polygon			
Alternative	< 50 meters	50 - 100 meters	100 – 400 meters	400 – 800 meters
A	1.6	1.5	10.5	15.0
B	1.6	1.5	10.5	15.0
B Modified	1.6	1.5	10.5	15.0
C	1.4	1.4	10.3	14.9

For measurable changes in aquatic populations to occur from indirect effects, aquatic habitat has to change as a result of changes in sedimentation levels, or the number of barriers has to change from what is currently present. Since this decision does not authorize ground disturbing actions, no barriers will be removed. With regard to sedimentation, this analysis accepts and tiers to the assumptions and analysis results in the Soil, Hydrology, and Watershed Section of this document.

Erosion rates on some routes could and likely will change. The literature indicates that increases and decreases in traffic intensity can correlate with changes in erosion rates on roadway surfaces (Luce and Black, 2001, Foltz 2008). Motorized use during wet periods can also increase erosion. The potential for rutting increases when road surfaces are wet. Ruts tend to concentrate the flow on the surface, funneling water along the flow-path until a cross drain structure or change of grade is encountered. Because the water is concentrated in a "channel" on the road, the erosive capability increases (Elliot et. al. 2009).

With this in mind, the alternatives in this analysis are compared based on 2 factors:
1. Whether motorized vehicle use on a route was maintained or eliminated.
2. Whether a change in the season of use was proposed, which would change the potential for surface erosion of the route.

Changes for each route with at least 1/10 of a mile within 300 feet of a stream, were assigned a positive (1), negative (-1), or neutral (0) value where changes in traffic levels are assured, or where changes in erosion rates are reasonably likely. The only changes in traffic levels that could be guessed with certainty, was routes where non-motorized traffic would be eliminated. Thus, where an alternative changed use on a route from "motorized" to "non-motorized" the value assigned was "1". The assumption being; since motorized use can increase erosion, removing it can decrease erosion. If motorized traffic was maintained, it was assigned a neutral value "0". Changes from a road to a trail, or from passenger vehicles to OHVs were not differentiated between and so were also given a neutral value. While OHV use can increase the potential for erosion, the greatest determinants of that potential are related to the physical characteristics of the route. Addition of unauthorized routes to the transportation system were rated as neutral, unless a change in season of use would occur which influenced motorized travel during wet periods. The neutral rating was based on the fact that they are currently being used and will continue to be used if added to the system.

Once values were assigned for each route, they were multiplied times the miles of stream that occur within 300 feet of it. Doing this resulted in a value representing the miles of stream near each route with some potential of being affected by this decision. Possible beneficial effects are represented by a positive value and possible negative effects are represented by a negative value.

For example: Imaginary route #45 has 1.1 miles of stream within 300 feet. Use is currently open to motorized traffic from June 1 – Oct 15. One alternative proposes to change the period of use to March 1 – Dec 31. Because this change would increase the potential for use during wet periods, and so increase the risk of erosion; it is assigned a negative value (-1) and multiplied times the length of stream within 300 feet (1.1 miles). This results in an end value of -1.1 miles, and implies the "possibility" (not a certainty) of increased surface erosion and so some possibility of sediment delivery to 1.1 miles of stream. Similarly, if management was to change from currently open to motorized vehicles to becoming "non-motorized"; a positive value (1) is assigned, because this should decrease the risk of erosion. This results in a value of 1.1 miles, implying a possible reduction in sediment delivery to 1.1 miles of stream.

The positive and negative values derived in this analysis cannot necessarily be equated to beneficial and negative aquatic impacts. We can assume that a change in the rate of erosion must occur for there to be a change in aquatic effects. However, we can't assume where there is a change in erosion, there will be a corresponding change in sediment delivery to water (sedimentation). This is greatly dependent on all the factors noted in the Hydrology portion of this document; the most influential of which will be unaffected by this decision (i.e. route proximity to water, topography of the area, type and abundance of vegetation between the route and the stream, road drainage features, BMPs employed, etc).

So, this analysis is essentially a "risk analysis". It has merit for alternative comparisons, because it is consistent with the literature and our understanding of conditions within the analysis area.

Alternative A represents the existing condition and so the analysis is based on changes from what currently occurs. For each alternative, the values were summed to give total miles of stream within 300 feet of roads/trails having some risk of change in erosion and sediment delivery. The results are presented below in Table 37, relative to WCT conservation populations, non-WCT or "other"

fisheries, and all perennial streams.

Table 37. Alternative comparisons of perennial stream miles and percent of total perennial stream miles within 300 feet of a route, with possible changes in the rate of erosion.

Aquatic Resource	Sum of Stream Miles with possibility of change in rate of sedimentation		
	Alt A to Alt B	Alt A to Alt B Modified	Alt A to Alt C
Streams with WCT Conservation Population	0	1.4	0.5
Percentage of WCT Conservation Population Miles	0	1.8%	.6%
Other Streams	9.1	21.4	21.4
Percentage of Other Stream Miles	1.1%	2.7%	2.7%
Total - All perennial Stream	9.1	22.8	21.9
Percentage of All Perennial Stream Miles	1.0%	2.6%	2.5%

Based on the analysis, all the alternatives result in positive values. This suggests the balance of change for each alternative reduces the risk of erosion and sedimentation to streams within the analysis area. The values indicate the possibility of reduced sedimentation for all action Alternatives over current travel management (Alternative A) for perennial streams without WCT conservation populations. Alternatives B Modified and Alternative C indicate slightly less risk of sedimentation than may occur if Alternative B is implemented. However, because there is very little difference in the values between alternatives and because sedimentation is dependent on so many things beyond the scope of this decision, the difference between alternatives relative to WCT and other fisheries across the analysis area is negligible.

There is no substantive change in risk of erosion on routes near streams with WCT conservation populations in Fish Key Watersheds, between Alternative A and Alternative C (Table 39). Approximately eight tenths of a mile on routes within 300 feet of a stream could see a reduction in erosion in Alternative B. This increases to 1.45 miles in Alternative B Modified. One tenth and six tenths of a mile of routes could see an increase in erosion in Alternatives B and B Modified, respectively. The analysis suggests an overall decrease in risk of erosion for both Alternatives, with a sum balance of 0.75 and 0.85 miles (Table 38). Again the small difference in values between alternatives, suggests no appreciable difference in effects.

Table 38. Alternative comparisons of WCT stream miles, in fish key watersheds, within 300 feet of a motorized route, which could see changes in the rate of erosion(1).

Risk Indicators	Miles of stream		
	Alt A to Alt B	Alt A to Alt B Modified	Alt A to Alt C
Routes within 300 feet of a stream with a WCT Conservation Population, in Fish Key Watershed which will have possible reduction in Erosion	0.85	1.45	0
Routes within 300 feet of a stream with a WCT Conservation Population, in Fish Key Watershed which will have possible increase in Erosion	0.1	0.6	0
Sum of Possible changes in erosion on routes within 300 feet of a route – in Fish Key Watersheds	0.75	0.85	0

Table 39 displays the difference in risk of erosion and sedimentation to streams occupied by grayling. Changes in management from Alternative A to Alternatives B and B Modified, could result in one half mile of stream with a decreased risk of sedimentation, and 0.7 miles of stream with an increased risk of sedimentation. The sum for both alternatives indicates some risk of increased sedimentation over two tenths of a mile of stream. This suggests there might be possible negative effects to grayling.

Familiarity with the Ruby River and the road and trail infrastructure, however, suggests this would be doughtful. While the existing road and trail system are responsible for sedimentation in some areas. The natural geologic instability of the Gravelly Range, is an over-riding cause for instability in the Ruby River. Slumps and other types of failures are a common occurrence through-out the drainage, resulting in excessive bedloads that cause the river to be adjusting and moving at an acceletated rate. The sedimentation that results from the constant adjustment of the river dwarfs the change in sediment introduction that would occur from traffic induced sedimentation over .2 of a mile. It is appropriate to believe the change would not be measurable. Analysis in the change from current conditions to Alternative C indicates a possible decrease in erosion and sedimentation over one tenth of a mile of stream. Again, the differences represented by the analysis would not be substantial enough to be measureable.

Table 39. Alternative comparisons of arctic grayling stream miles, within 300 feet of a motorized route, which could see changes in the rate of erosion (1).

Risk Indicators	Miles of stream		
	Alt A to Alt B	Alt A to Alt B Modified	Alt A to Alt C
Routes within 300 feet of a stream with grayling which will have possible reduction in Erosion	0.5	0.5	0.1
Routes within 300 feet of a stream with grayling which will have possible increase in Erosion	-0.7	-0.7	0
Total possible changes in erosion on routes within 300 feet of a grayling stream1	-0.2	-0.2	0.1

1 – All grayling stream miles on Forest are considered to be within the Ruby River

With reguard to effects on grayling from travel changes on routes within 300 feet of an occupied stream, Alternatives B and B Modified will result in an increase of 0.2 mile of stream that will have an increase in possible erosion from Alternative A. Alternative C will have a 0.1 mile decrease in stream miles that will have a reduction in erosion from Alternative A.

Changes to travel routes will not result in substantially different recreational access to streams and lakes than is currently available. Thus, the potential for increasing or decreasing aquatic nuisance species introduction is considered minimal for these alternatives.

Summary of Indirect Effects

The pertinent question for this analysis is how much measurable change in aquatic habitat will occur from sedimentation if each of the alternatives is implemented. While, the literature indicates surface erosion can increase with increased traffic levels, the studies tended to look at the effects from logging truck traffic and not passenger vehicles. We expect those results to reflect greater changes than we would see over most of the analysis area. While changes in motorized traffic can influence erosion rates, the effect of change here almost certainly represents a small portion of the total erosion that persists over time. The greatest potential for reducing long-term erosion levels to desirable levels most often lies with stabilization and re-vegetation of the surface or cut and fill slopes of the road

prism.

There is no way to imply a correlation between miles of road susceptible to erosion and sediment delivery to the stream. We estimate that probably 15 to 35% of the stream lengths within 300 feet of a stream contribute sediment and most of the contribution comes when the route is immediately adjacent to the stream. This analysis, however, (in an attempt to keep it manageable) treats all routes within 300 feet of a stream, similarly.

This implies all route segments are equally susceptible to erosion and sediment delivery, and the amount of sediment available is the same. We know this is not the case.

The most consistent continuous sources of sediment introduction occur at stream crossings and the most eggreious contributions tend to occur at poorly located and/or constructed crossings. The number and locations of stream crossings will not change through this project. Further, erosion from motorized travel represents only a portion of the total erosion that occurs. It would be naïve to assume that removing motorized traffic from a segment of road with a crossing would eliminate sedimentation. It precludes any consideration of the slope of approaches, road surface and drainage characteristics, cut and fill slope characteristics which are fundamental in defining the potential for introduction.

The vast majority of the soil displacement from travel routes within the project and analysis areas occurs because of the route's proximity to a stream and its physical characteristics. That is why serious efforts to reduce erosion nearly always focuse on these very things by improving stream crossings, altering the road surfacing or adding drainage structures and slope breaks to reduce time water stays on the road, re-vegetating cut and fill slopes, or finally reducing the road's proximity to streams. It seldom focus' on changing levels of motorized traffic. This is supported by the TMDL completed for the Ruby River in discussing Ramshorn Creek. The factors listed as responsible for contributing sediment are because the road is no longer crowned and the material from the road surface is piled at the edge of the road and stream (this creates a burm, contrary to desirable road drainage that gets water off the road surface as quickly as possible), and water (that collects on the road surface) is not diverted before it can flow into the stream at a low spot in the road.

The most significant and dramatic erosion events often result from catastrophic failures caused by debris blockages at crossings or mass wasting from altered sub-surface water routes related to the road or trail (Gucinski et al 2001), Their occurrence is not rare. When evaluated at a scale that is commensurate with the analysis area of this project, they happen with relative frequency.

At this time there is no great way to forecast the level of maintenance that will occur, or how well it will be implemented, or the extent of BMPs that will be applied. However, most of these management actions do not require new NEPA for implementation. Thus, line officers tend to annually consider needs and direct maintenance where they believe it is most appropriate. The literature indicates these activities, if done properly, can often mitigate erosion or sediment delivery to levels that are relatively inconsequential (Burroughs and King 1989, Luce and Black 1999, NCASI 1985).

Considering:
1) That erosion resulting from motorized traffic represents a minor portion of the erosion that continuously occurs; and that the location and physical characteristics of the road/trail prism are the primary factors driving sedimentation.
2) That substantial variability between routes makes reliable predictions regarding the influence of travel management changes difficult.
3) That the analysis indicates little difference between alternatives regarding the over-all change in

erosion on routes within 300 feet of streams; and that
4) There is no reliable way to forecast the level of maintenance that will occur on each of the routes where travel management has changed; or how well it will be implemented; or the extent of BMPs that will be applied.

It cannot be said with any certainty that differences in the "risk of erosion" as portrayed by values in Tables 32 - 34, represent different effects between alternatives. The analysis suggests changes proposed in alternatives B, B Modified, and C are likely to decrease the amount of sediment delivered to streams in the analysis area. The analysis also suggests Alternative B Modified reduces the risk of sediment introduction more than the other Alternative. Because of substantial variability between routes and the uncertainty described above, a measurable reduction in sediment delivery by any of the alternatives is not guaranteed.

Cumulative Effects
Based on the past, present and reasonably foreseeable actions (see Table 6 in specialist report), the fact that this decision will result in no ground disturbing activities, and minimal change from current conditions, there should be no cumulative effects for aquatic resources with the closure of an additional 32.9 miles of routes to motorized use under Forest Plan ROD 2.

Alternative A, No Action

*Direct Effects***:**
Direct effects include risk of vehicles altering aquatic habitat and crushing fish (at fords only) and crushing amphibians throughout the extent of the routes open to motorized vehicles. Levels of effect are reflected by current/existing conditions.

Indirect Effects:
Indirect effects result from sedimentation influencing aquatic habitat or from stream crossings preventing passage for fish or amphibians. Levels of effect for this alternative are reflected by current/existing conditions.

Instream habitat for aquatic populations is closely related to the condition of the riparian and how well the hydro-geomorphic processes in the stream are balanced - or in equilibrium. If these things occur the stream is able to effectively transport the sediment it receives and can access its floodplain appropriately. When stream and riparian processes work effectively together, the stream is considered to be functioning properly, and aquatic habitat abundance and quality tend to be maximized.

Streams within the analysis area range from functioning to non-functioning condition. The range and frequency of stream conditions probably resemble those described in the BDNF Revised Land and Resource Management Final Environmental Impact Statement (FEIS). Motorized routes occur in a substantial proportion of RCA's within the analysis area, and in many cases are a sediment source to streams. Motorized traffic is undoubtedly responsible for some of the sedimentation, but the majority is determined by the location and physical characteristics of the route itself.

Cumulative effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions for aquatic resources (Table 6 in specialist report). Specific to Alternative A, this includes existing routes that are currently on the transportation system, along with unauthorized routes and the 32.9 miles of closed routes under Forest Plan ROD 2.

Alternative B, Proposed Action

Direct Effects:
Direct effects include risk of vehicles altering aquatic habitat and crushing fish (at fords only) and crushing amphibians throughout the extent of the routes open to motorized vehicles. The sum of effects on aquatic resources from this alternative are considered very similar to current/existing conditions (Alternative A). This is primarily because the over-all incidence of streams susceptible to crossings at fords changes minimally. Thus, no measurable change will occur to habitat or populations from implementing Alternative B.

Indirect Effects:
Indirect effects resulting from implementing Alternative B are considered to be similar to Alternative A. While the analysis indicated road and trail erosion could be reduced, variability between routes and uncertainty regarding the extent of change leave doubt that it will be discernable from the more substantial sources of sedimentation unrelated to motorized traffic. These are primarily related to the presence and physical characteristics of the road and trail prisms.

Cumulative Effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions (Table 6 in specialist report) along with the effects from Alternative B. The cumulative effects for this alternative are similar to those specific to Alternative A. For reasons described above in the analysis, there is little change from current/existing conditions including taking into account the 32.9 miles of closures under Forest Plan ROD 2.

Alternative B Modified

Direct Effects:
Direct effects include risk of vehicles altering aquatic habitat and crushing fish (at fords only) and crushing amphibians throughout the extent of the routes open to motorized vehicles. The sum of effects on aquatic resources from this Alternative are considered very similar to current/existing conditions (Alternative A). This is primarily because the over-all incidence of streams susceptible to crossings at fords changes minimally. Thus, no measurable change will occur to habitat or populations from implementing Alternative B modified.

Indirect Effects:
Indirect effects resulting from implementing Alternative B Modified are considered to be similar to Alternative A and Alternative B. While the analysis indicated road and trail erosion could be reduced and potentially sedimentation, variability between routes and uncertainty regarding the extent of change leave doubt that it will be discernable from the more substantial sources of sedimentation unrelated to motorized traffic. These are primarily related to the presence and physical characteristics of the road and trail prisms. At a minimum, implementing this alternative should not result in negative effects on aquatic resources across the analysis area.

Cumulative Effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions (Table 6 in specialist report) along with the effects from Alternative B Modified. The cumulative effects for this alternative are similar to those specific to Alternatives A and B. For reasons described above in the analysis, there is little change from current/existing conditions.

Alternative C

Direct Effects:
Direct effects include risk of vehicles altering aquatic habitat and crushing fish (at fords only) and crushing amphibians throughout the extent of the routes open to motorized vehicles. Effects on aquatic resources, from Alternative C, are considered similar to those from A, B and B Modified. This is primarily because the over-all incidence of streams susceptible to crossings at fords changes minimally. Thus, no measurable change will occur to habitat or populations from implementing Alternative C.

Indirect Effects:
Indirect effects resulting from implementing Alternative C are considered similar to Alternative A, B and B Modified. While the analysis indicated road and trail erosion could be reduced, variability between routes and uncertainty regarding the extent of change leave doubt that it will be discernable from the more substantial sources of sedimentation unrelated to motorized traffic. These are primarily related to the presence and physical characteristics of the road and trail prisms. At a minimum, implementing this alternative should not result in negative effects on aquatic resources across the analysis area.

Cumulative Effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions (Table 40 in specialist report) along with the effects from Alternative B Modified. The cumulative effects for this alternative are similar to those specific to Alternatives A, B and B Modified. For reasons described above in the analysis, there is little change from current/existing conditions including taking into account the 32.9 miles of closures under Forest Plan ROD 2.

Table 40. Consistency with laws, regulations, policy and the Forest Plan

Management Direction Document	Alt. A	Alt. B	Alt B Modified	Alt C
1982 viability regulations	Meets	Meets	Meets	Meets
Forest Plan Goals	Meets-1	Meets-1	Meets-1	Meets-1
Forest Plan Objectives	Meets-1	Meets-1	Meets-1	Meets-1
Forest Plan Standards	Meets	Meets	Meets	Meets
WCT Conservation Agreement	Does not preclude attainment of objectives	Does not preclude attainment of objectives	Does not preclude attainment of objectives	Does not preclude attainment of objectives

1 – While existing conditions for all aquatic resources are not meeting all Forest Plan Goals and Objectives, motorized vehicle travel within the analysis area is not preventing their attainment

Sensitive Aquatic Species Biological Evaluation Effects Determinations Westslope Cutthroat Trout and Fluvial Arctic Grayling.

When considered across the analysis area, measureable differences between Alternative A and any of the action alternatives relative to sediment introduction to WCT or Fluvial Arctic Grayling streams are unlikely. Some streams will see increases in the “risk” of sedimentation and others will see a decrease. Across the analysis area, the analysis suggests an overall decrease in risk of indirect effects (sedimentation) from changes in vehicle traffic. All alternatives for this project result in some potential for vehicle related mortality to cutthroat and grayling at fords, but the effects would be negligible, because such a small percentage of the overall occupied lengths of stream are affected. Resulting changes should not be great enough to threaten WCT or grayling populations, and so will

not be a threat to viability across the Beaverhead-Deerlodge National Forest. As such, the call for all alternatives is “May impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species.

There is minimal to no change between the existing condition and any of the action alternatives relative to sediment introduction to streams. Based on results of the analysis minimal to no change is expected in sedimentation rates for ponds or wetlands either.

All alternatives for this project result in some potential for vehicle related mortality to Western (boreal) Toad, but it would not be substantial enough to threaten populations, and so will not be a threat to viability across the Beaverhead-Deerlodge National Forest. As such, the call for all alternatives is “May impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species.

Regarding the sensitive Northern Leopard Frog, whose upper elevation limit in the state of Montana is about 6700 feet, roughly equivalent to the District’s land ownership boundary, no individuals or populations of this species are known to exist within the project area. The closest historical populations would be near the town of Ennis (Moores Creek crossing of Hwy 287) and the vicinity of the confluence of the Big Hole and Beaverhead Rivers near Twin Bridges, MT. Both of these sites are located over 5 miles from the nearest FS land ownership. The nearest known existing population is in the vicinity of Three Forks, MT, over 30 miles from the nearest point on the Madison RD. Given the spatial separation of the project area from known and historic northern leopard frog populations, it is determined that all alternatives for this project will have “No Impact” upon individuals, populations, or habitat of this species.

Hydrology and Watershed

Existing Condition

The analysis area includes portions of the Ruby and Madison River drainages above the Beaverhead-Deerlodge NF boundaries. Essentially, this includes the southern portion of the Tobacco Root Mountains, the west slope of the Madison Mountains, and most of the Snowcrest, Greenhorn and Gravelly mountains (see Appendix A, General Project Area Map). Seventy-nine different sub-watersheds (6th level HUCs) comprise the area. There are 887 miles of perennial stream. Stream conditions over most reaches tend to be fair to excellent. A smaller percentage represents those in poor condition. Past hydrologic surveys in the Tobacco Roots found that 13 of 17 stream reaches evaluated were functioning properly, 2 were "functioning" at risk, and 2 were non-functioning.

Road building and maintenance began during the establishment of early timber harvest and mining claims in the late 19th century. Most historical routes were built up the major stream valley bottom areas, as this allowed construction with the least amount of effort. Many destinations (mining sites, recreational sites, access to water supplies, etc.) are located within the valley bottom areas. These established roads were retained over time and represent the majority of routes as displayed. For streams within the Ruby River drainage, this agrees with the Ruby River TMDL assessment. This analysis points to a field inventory that should concentrate on routes within valley bottom areas to further define effects and needed management actions. This is beyond the scope of this analysis. While some specific areas express a risk associated with the other attributes, these areas are relatively minor and generally rate a lower priority for further investigations.

There are 32 water quality limited streams within the analysis area, as documented by the 2008 303-d list (Montana Dept of Environmental Quality). Eighteen of these streams are in the Ruby River drainage and fourteen are in the Madison River drainage. All of these streams are not necessarily impaired on Forest lands. Montana DEQ in many instances identified a stream as "impaired", but reaches of concern were not specified. Sediment is a common source of impairment limiting beneficial uses; and cold water fishery is a common beneficial use in this area.

Within the Project area there are 427 stream crossings. Three hundred and eight miles of perennial stream (34.7% of the total stream length) have a road or trail (motorized and non-motorized) within 300 feet.

Effects Analysis

Introduction

The decision will define the road and trail system open to motorized use, including any other restrictions that may apply. Actions such as stabilization or decommission (for example, obliteration of road prism) of closed roads or trails are not part of this decision. The decision will offer the opportunity to better manage existing effects through route designation. Selected non-system routes converted to system routes are then candidates to receive funding for maintenance actions. See Table 37 below for miles of road/trail by alternative which will be converted to system routes. Non-system routes not proposed for designation as system routes are eligible for any needed stabilization or obliteration work through restoration funds.

Maintenance actions can produce positive effects if done properly where Best Management Practices (BMPs) are lacking. BMPs include proper planning, design, and mitigation measures necessary for meeting State Water Quality Standards and TMDL allocations, which apply to Water Quality Limited Segments with sediment listed as contributing to the cause of the listing. Potential effects considered

include direct, indirect, and cumulative.

Effects Discussion
Direct effects are those caused by the action and occur at the same time and place. With regard to travel management, the most likely occurrences of direct hydrologic effects would be air-born dust from heavy traffic depositing in a stream or wetland; or a fuel spill entering a stream and altering water quality.

Indirect effects are caused by the action and occur later in time and/or are removed in distance. Indirect effects to water resources from recreational travel are mainly associated with sediment delivery to water bodies from the route surface, or its cut and fill slopes; and/or influencing surface or subsurface water flow. An activity that generates soil movement or erosion must be "hydrologically connected" to a stream system to affect the water resource and beneficial uses (Ketcheson and Meghan 1996).

Cumulative effects are the sum of effects from implementing the proposed action or an alternative, plus effects from other past, present, and reasonably foreseeable future actions. These may include effects from livestock grazing, mining, timber harvest, prescribed burning, wildfire, implementation of ROD 2 which closes 32.9 miles of routes to motorized use, and any other actions that influence stream function or water quality. The final interpretation of cumulative effects is whether reductions in stream function or detrimental changes in water quality might occur.

Analysis and Inherent Assumptions

Direct Effects
As mentioned above, direct effects would most likely be related to contamination from fuel spills or air-born dust from heavy traffic. Use levels on most Forest routes are relatively light, making fuel spills extremely unlikely (and as evidenced from their lack of occurrence in the past). Mill Creek Road out of Sheridan represents the higher end of use levels for non-paved roads (pers. communication Forest Transportation Engineer). From 2000 to 2006 Mill Creek road supported traffic levels estimated at 20 vehicles/day on weekdays, and 35 vehicles/day on weekends. The majority of changes proposed in this Updated EA are on lower use roads, where traffic levels are closer to an average of 5-10 vehicles per day or lower (pers. communication Forest Transportation Engineer). Low use also suggests changes related to air-born dust will be inconsequential. Based on this information, it is assumed direct effects from any changes in travel management are like-wise negligible.

Indirect Effects
Indirect effects will be inherently tied to the transportation system – i.e. the actual routes; and almost exclusively related to two things: 1) sediment delivery from road and trail prisms; and 2) interruption, diversion or confinement of surface and subsurface water. A measure representing the level of influence on surface and sub-surface water is the number of stream crossings. The number of crossings within the analysis area does not change between alternatives because there are no ground disturbing activities. As such, this analysis will focus on predicted changes in sedimentation and stream crossings that would result from implementing each of the alternatives.

For the purposes of this analysis, only roads and trails within 300 feet of perennial streams are considered to have the potential to be hydrologically connected. However, not all roads within 300 feet are connected. Beyond 300 feet, any sediment that might be produced would typically be immobilized by vegetation and other ground barriers, before it reaches water.

The extent of sedimentation that occurs from roads and trails is dependent on many factors. The most important of these are:

- Total length of the route that is hydrologically connected to water courses.
- Surface width of the route and the amount of exposed soil.
- Slope of the route and the distance water can travel along its surface.
- The geology of the area and soils comprising the route surface.
- Surrounding topography – i.e. the steepness of adjacent slopes.
- The number of stream crossing structures.
- The capacity of stream crossing structures to pass high flows.
- Precipitation patterns.
- Vegetative characteristics of adjacent riparian areas.
- The frequency that route maintenance occurs.
- How route maintenance is implemented.
- Whether BMPs have been implemented.

Factors that have relatively less influence include:

- Vehicle Type (VT).
- Traffic level (intensity).
- Season of Use (SOU).

The potential for sediment delivery from any route is first dependent on its proximity to a stream course. As the length of road or trail near a stream increases and/or as the distance between them decreases; impacts to the stream generally increase. Increased sedimentation also occurs as the number of stream crossings increase. Failure of culverts across Forest Service lands has been a nagging problem over the years. It occurs because many culverts have not been designed to handle high water events, which are not necessarily typical, but are predictable as 10 to 100 year events. A more common and insidious occurrence is “incomplete” failure, where water pools against the road prism or flows over the top of the road for an abbreviated period, causing substantial erosion and the need for repair. This is typically caused by partial or complete debris blockages at the upstream end; or water passage limitations during common high water events. The need to reestablish/repair the road prism becomes priority so its use can continue. Inherent in reestablishment of the prism is a repeated “refilling” of the sediment source for future events.

Beyond stream proximity, the physical characteristics of each route define the intensity, extent and location of sediment related impacts. As mentioned above, they are: width, slope, drainage features, geology, soils, adjacent topography, the capacity of crossing structures etcetera. All of these characteristics vary substantially between routes and are primary determinants of the extent of sedimentation that occurs.

The decision rendered from this Updated EA will not alter or remove any routes from the landscape. It will only influence those factors above that have less influence on erosion of the route surface. These are VT, traffic levels (motorized vehicle restrictions, and route designation), and season of use (periods when roads are wet and more prone to erosion). The extent of changes proposed from the existing condition (Alternative A) for routes within 300 feet of perennial streams are provided in Table 41 below.

Table 41. Comparison of travel management changes on routes within 300 feet of perennial streams for Alternatives B, B modified and C.

Types of Route Changes Proposed	Miles w/in 300 feet of a Perennial streams Alt B	Miles w/in 300 feet of a Perennial streams Alt B modified	Miles w/in 300 feet of a Perennial streams Alt C
Add dispersed site access to system as trail	3.4	3.3	0.0
Add unauthorized road to system	0.5	0.5	0.0
Add unauthorized trail to system	0.3	0.3	0.0
Change VT/SOU	10.3	26.0	0.0
Close system road	7.4	8.9	0.0
Close system trail	4.2	4.2	0.0
Close unauthorized road	0.3	0.4	0.6
Close unauthorized trail	0.0	0.0	0.3
Close dispersed site access	0.0	0.0	3.4
Convert to trail	21.4	17.8	0.0
Decommission system road	0.2	0.2	0.0
Total	47.8	61.6	4.3

Based on changes to travel management on routes within 300 feet of streams displayed in Table 41, beneficial or negative effects could be inferred. For instance, the addition of unauthorized routes near streams seems to suggest a negative effect and the closures of system roads and unauthorized routes seem to imply benefits. Beneficial changes could be inferred when motorized travel is changed to occur primarily outside periods of increased precipitation.

However, greater consideration suggests effects from these changes can be influenced by changes to the route characteristics and so can change in time. Further, the changes inferred above are really about changes in erosion of roads or trails. It presumes when that occurs, sediment deposition into water bodies is automatic. This is not always the case.

But first, let's consider inferences regarding erosion. The addition of unauthorized routes in most instances within the analysis area means a continuation of what is currently occurring. This effectively results in no change. From a different perspective, if the road is not currently maintained, bringing it into the authorized road system might allow it to be regularly maintained. But if maintenance is not done properly or is done too frequently, erosion can increase. Maintenance funds have undergone substantial fluctuations in the past and funding levels preclude some routes from being maintained. However, officials have the authority to direct maintenance where needs are greatest. If aquatic effects are of major concern, a segment of road can be elevated on the priority list.

Removing motorized traffic can infer benefits for aquatics, but there are caveats to this situation also. Re-establishment of vegetation on the road prism will eventually stabilize soils and reduce erosion. But, for many routes, a decade may be required. In some instances it might not occur for two or more

decades. The length of time required for and the extent of, soil stabilization will vary depending on the level of compaction, soil characteristics, the types of vegetation adjacent to the road, and the amount of foot or livestock traffic that occurs after closure to motorized traffic. Some season of use changes reduce travel during periods of increased precipitation (fall through spring). However, measurable reductions in erosion still require sufficient road surface drainage for discernable benefits. If drainage features are inadequate, erosion tends to be constant and in many cases will "drown out" the benefits of reduced traffic.

While some might infer beneficial or negative effects related to changes in motor vehicle restrictions, route designation, or season of use restrictions -- in reality, any assurance they will result in measurable changes in erosion is tenuous, since their effects are dependent on, and subservient to, physical characteristics of the routes. Benefits realized are often a matter of degree, are highly variable, and are often minor relative to larger effects associated with the simple presence of stream crossings and other road or trail segments that are near streams. The changes to travel management proposed in different Alternatives do not change the number of stream crossings or the miles of road near streams (Table 42).

Table 42. Comparison of route features in Alternatives A, B, B modified and C. that generally correlate with sedimentation.

Factors influencing Sedimentation	Alternative A	Alternative B	Alt B modified	Alternative C
# of Stream Crossings	427	427	427	427
Miles of route within 300 feet of streams	334	334	334	334
Miles of Route within 300 feet of 303d listed streams	126	126	126	126

Water Quality Limited (TMDL) Streams:

We accept that erosion rates on some routes could and likely will change. The literature indicates that increases and decreases in traffic intensity can correlate with changes in erosion rates on roadway surfaces (see aquatics section of this document). The following analysis uses the same procedures described in the aquatics section to consider differences between alternatives relative to TMDL streams within the analysis area.

Where alternatives result in a change from current use potential to greater use during wet periods, the risk of erosion is presumed to increase. The change is considered potentially detrimental and is assigned a negative value. If the proposal is to change from currently open to motorized vehicles to "non-motorized"; the risk of erosion is presumed to decrease. The change is considered to be potentially positive and is assigned a positive value. Where route designations were changed from roads to trails, without a change in Season of Use a neutral value was assigned. This was primarily because existing uses in many instances will not change. If the route characteristics lend themselves to primary use by OHVs, even though it is currently designated a road, then re-designation as a trail will result in little change. While the width of the route prism "may" change over time, the level of erosion and potential for sedimentation are primarily defined by many other factors outside the scope of the decision made.

Possible beneficial effects are represented by a positive value (representing miles of stream with potential reductions in sedimentation) and possible negative effects are represented by a negative value (representing miles of stream with potential increases in sedimentation).

The positive and negative values derived cannot be equated to beneficial and negative aquatic impacts. The analysis is a "risk assessment" specific to the potential for change in rates of erosion. It does not presume an equal correlation between erosion and sediment delivery to water bodies. We can assume that a change in the rate of erosion must occur for there to be a change in aquatic effects. However, we can't assume where there is a change in erosion there will be a corresponding change in sedimentation. This is dependent on all the factors noted above; the most influential of which will be unaffected by this decision (i.e. route proximity to water, topography of the area, type and abundance of vegetation between the route and the stream, BMPs employed, etc). So, the following is essentially a "risk analysis, for the purposes of alternative comparison.

Table 43 provides a comparison of Alternatives with regard to the potential for a change in the rate of erosion, and so a change in potential for sedimentation, from routes within 300 feet of a TMDL stream. The sum of change regarding the risk of erosion is positive for all alternatives, indicating the potential for overall benefits to water quality limited streams. The analysis indicates Alternative B modified has the potential to provide the greatest benefit relative to water quality limited streams. It suggests the potential for reduced sedimentation over 3.1 miles of stream and the potential for increased sedimentation over 0.25 miles of stream, for a balance of potential benefit over 2.85 miles of stream.

Table 43. Alternative comparisons of miles of TMDL stream within 300 feet of a road or trail, with a change in the potential for sedimentation.

Risk Indicators for Sedimentation	Miles of stream within 300 feet of a TMDL stream		
	Alt A to Alt B	Alt A to Alt B Modified	Alt A to Alt C
Routes within 300 feet of a TMDL stream which will have a possible reduction in erosion.	0.4	3.1	2.1
Routes within 300 feet of a TMDL stream which will have a possible increase in erosion.	0.25	0.25	0
Sum of possible change in risk of erosion.	0.15	2.85	2.1

Municipal Watersheds:
Relative to Municipal watersheds, Alternative C resulted in no change from current conditions. Alternatives B and B modified reduced the risk of sedimentation to 2.2 miles of stream from current conditions.

Perennial Streams:
The aquatics section compares results for all alternatives regarding perennial streams.

Alternative A - No Action Alternative

Direct Effects:
Direct effects are related to contamination from fuel spills or air-born dust from heavy traffic. Use levels on most Forest routes are relatively light, making fuel spills extremely unlikely (and as evidenced from their lack of occurrence in the past). Mill Creek Road out of Sheridan represents the higher end of use levels for non-paved roads (pers. communication Forest Transportation Engineer). From 2000 to 2006 Mill Creek road supported traffic levels estimated at 20 vehicles/day on weekdays, and 35 vehicles/day on weekends. The majority of changes proposed in this Updated EA are on lower use roads, where traffic levels are closer to an average of 5-10 vehicles per day or lower (pers. communication Forest Transportation Engineer). Low use also suggests changes related to air-born dust will be inconsequential. Based on this information, it is assumed direct effects from any

changes in travel management are like-wise negligible.

Indirect Effects:
Indirect effects are related to sedimentation from roads and trails, which currently result from travel management. There are 32 water quality limited streams within the analysis area, as documented by the 2006 303-d list (Montana Dept of Environmental Quality). Eighteen of these streams are in the Ruby River drainage and fourteen are in the Madison River drainage. All of these streams are not necessarily impaired on Forest lands. Montana DEQ in many instances identified a stream as "impaired", but reaches of concern were not specified. Sediment is a common source of impairment limiting beneficial uses; and cold water fishery is a common beneficial use in this area. For many of the streams the sources of sediment are attributed primarily to riparian degradation and resulting streambank erosion, road and urban inputs (for sediment and nutrients) and dewatering.

A TMDL has been completed for the Ruby River Drainage. It lists the 20 most severe road-related sediment sources. These 20 sites account for approximately 91% of the assessed sediment load from road-related sources in inventoried reaches. A large portion (67.5%) of the road-related sediment load was attributed to one reach on Ramshorn Creek (Table 10-3 in Hydrology report). The next 19 sites account for 23.5% of the estimated load due to roads. The load from the highest priority site on Ramshorn Creek may be overestimated, but it is considered the most critical site. The document also stated that "the highest priority site on Ramshorn Creek is contributing high sediment loads due to several factors. The road is directly adjacent to the stream at this site. Road grading practices contribute sediment directly to the stream because roads are not re-crowned and material from the road surface is piled at the edge of the road and stream. Grading can contribute high sediment loads over time because additional material is loosened and delivered to the channel every time roads are maintained.

Additionally, water is not diverted from the surface before it can flow into the stream at a low spot in the road. Livestock concentrate on the road, exacerbating the problem further by creating a path from the road surface to the stream and kicking loose material from grading into the stream." The most substantial areas of sediment loading are below the Forest Boundary.

As discussed above, the primary reasons for sedimentation are related to factors other than traffic levels for motorized vehicles.

Cumulative Effects:
For Alternative A, cumulative effects equal the sum of effects from past, present, and reasonably foreseeable future actions for aquatic resources. This includes the effects of existing routes on surface and subsurface water flow and sediment delivery to water bodies from existing routes that are currently on the transportation system, along with additional roads and trails accessing dispersed access sites and unauthorized routes as well as the 32.9 miles of motorized route closures under Forest Plan ROD 2.

Alternative B – Proposed Action

Direct Effects:
Direct effects are the same as described for Alternative A because air-born dust is currently considered to have negligible effects and the overall risk of fuel spills will not change to any measureable degree.

Indirect Effects:
Indirect effects are related to sediment delivery to water bodies. Potential effects to perennial streams

across the analysis area are described in the aquatics section and indicates road and trail erosion could be reduced (and so possibly sedimentation) for approximately 1% of the total stream miles. However, variability between routes and uncertainty regarding the extent of change leave doubt that it will be discernable from the more substantial sources of sedimentation unrelated to motorized traffic. These are primarily related to the presence and physical characteristics of the road and trail prisms.
The analysis indicates an overall reduction in the risk of sedimentation to 0.15 miles of TMDL streams, and to 2.2 miles of stream in Municipal Watersheds. This may or may not measurably influence sedimentation, for the reasons discussed above in the analysis.

Cumulative Effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions including the 32.9 miles of motorized route closures under Forest Plan ROD 2 (Table 1 in the Hydrology report) along with the effects from Alternative B. The cumulative effects for this alternative are similar to those specific to Alternative A, primarily because we know that erosion often does not result in sedimentation, and because the effects from travel management are considered a small portion of the overall sediment loads introduced into these systems. We expect no detectable changes in stream function or stability.

When considered cumulatively, we expect negative influences on TMDL streams to be negligible. We also expect the potential reductions in erosion to result in little change to over all sedimentation, and probably no shifts in stream function conditions on individual streams. There is also no expected measurable effect on Municipal Watersheds.

Alternative B Modified

Direct Effects:
Direct effects are the same as described for Alternative A because air-born dust is currently considered to have negligible effects and the overall risk of fuel spills will not change to any measureable degree.

Indirect Effects:
Indirect effects are related to sediment delivery to water bodies. Potential effects to perennial streams across the analysis area are described in the aquatics section and indicates road and trail erosion could be reduced (and so possibly sedimentation) for approximately 2.6% of the total stream miles. However, variability between routes and uncertainty regarding the extent of change leave doubt that it will be discernable from the more substantial sources of sedimentation unrelated to motorized traffic. These are primarily related to the presence and physical characteristics of the road and trail prisms.
The analysis indicates an overall reduction in the risk of sedimentation to 2.8 miles of TMDL streams, and to 2.2 miles of stream in Municipal Watersheds. This may or may not measurably influence sedimentation, for the reasons discussed above in the analysis.

Cumulative Effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions including the 32.9 miles of motorized route closures under Forest Plan ROD 2 along with the effects from Alternative B. The cumulative effects for this alternative are similar to those specific to Alternative A, primarily because we know that erosion often does not result in sedimentation, and because the effects from travel management are considered a small portion of the overall sediment loads introduced into these systems. We expect No detectable changes in stream function or stability.

When considered cumulatively, we expect negative influences on TMDL streams to be negligible.

We also expect the potential reductions in erosion to result in little change to over all sedimentation, and probably no shifts in stream function conditions on individual streams. There is also no expected measurable effect on Municipal Watersheds.

Alternative C

Direct Effects:
Direct effects are the same as described for Alternative A because air-born dust is currently considered to have negligible effects and the overall risk of fuel spills will not change to any measureable degree.

Indirect Effects:
Indirect effects are related to sediment delivery to water bodies. Potential effects to perennial streams across the analysis area are described in the aquatics section and indicates road and trail erosion could be reduced (and so possibly sedimentation) for approximately 2.5% of the total stream miles. However, variability between routes and uncertainty regarding the extent of change leave doubt that it will be discernable from the more substantial sources of sedimentation unrelated to motorized traffic. These are primarily related to the presence and physical characteristics of the road and trail prisms. The analysis indicates an overall reduction in the risk of sedimentation to 2.1 miles of TMDL streams, and to 0 miles of stream in Municipal Watersheds. Changes in the risk of erosion may or may not measurably influence sedimentation, for the reasons discussed above in the analysis.

Cumulative Effects:
The cumulative effects for this alternative equal the sum of effects from past, present, and reasonably foreseeable future actions including the 32.9 miles of motorized route closures under Forest Plan ROD 2 along with the effects from Alternative C. The cumulative effects for this alternative are similar to those specific to Alternative A, B and B modified, primarily because we know that erosion often does not result in sedimentation, and because the effects from travel management are considered a small portion of the overall sediment loads introduced into these systems. We expect no detectable changes in stream function or stability.

When considered cumulatively, we expect negative influences on TMDL streams to be negligible. We also expect the potential reductions in erosion to result in little change to over all sedimentation, and probably no shifts in stream function conditions on individual streams. There is also no expected measurable effect on Municipal Watersheds.

Table 44. Consistency with Forest Plan Standards

Item of Comparison	Alternative A	Alternative B	Alternative B Modified	Alternative C
Forest Plan Standard 1, page 18	Meets	Meets	Meets	Meets
Forest Plan Standard 4, page 18	Meets	Meets	Meets	Meets
Forest Plan Standard 18, page 20	Does Not Meet	Meets	Meets	Meets

Table 45. Summary of Effects and Comparison of Alternatives

Item of Comparison	Alternative A	Alternative B	Alternative B Modified	Alternative C
Changes to surface and sub-surface flows	No change	No change	No change	No change

Item of Comparison	Alternative A	Alternative B	Alternative B Modified	Alternative C
Changes in stream function related to sedimentation	No change	No change	No change	No change
Changes in condition of TMDL streams related to sedimentation	No change	No change	No change	No change
Changes to water quality in municipal watersheds related to sedimentation	No change	No change	No change	No change
Ranking of alternatives relative to risk of sedimentation	4	2	1	3
Overall ranking of Alternatives	1	1	1	1

Botany and Weeds

Existing Condition

In the state of Montana three plant species are listed as threatened. No plant species are listed as endangered in the state. Of the three plant taxa listed as threatened none occur on Beaverhead-Deerlodge National Forest systems lands.

The Regional Forester of the Northern Region has identified plant, bird, and animal species for which viability is a concern as Sensitive. Sensitive Species are those recognized on the Update of Northern Region Sensitive Species List dated October 26, 2004. Thirty nine vascular plant taxa are listed as sensitive for the Beaverhead-Deerlodge National Forest. Of these, twelve have known occurrences within the boundaries of the Madison Ranger District.

The Montana Natural Heritage Program tracks rare plant, animal and plant communities located in the state. As new information is received the status of individual species or community is review for rarity and management impacts as to the health and continued survival of the element.

After review of existing element occurrence reports (Sensitive Species List and 2670 Files), Montana Natural Heritage Program database, literature (see Item 7, References), general habitats available (existing roads and trails), and field reviews (1991-2009), six sensitive species were found to occur within one hundred feet of an open motorized road or trail on National Forest Systems lands. Due to the limited nature of these species less than three miles of road have a sensitive plant population within one hundred feet of the road prism.

Effects Analysis

Resource Factors to be Analyzed and Units of Measure:
Factors: Sensitive plants

Metrics: Number of known sensitive plants with populations occurring within 100 feet of a road/trail open for wheeled motorized use.

Impacts to sensitive plants by wheeled motorized vehicles are tied directly to the physical effects of plants being crushed or soil disturbed by vehicles. No sensitive plant populations are known to grow in road or trail prisms. Impacts may come from vehicles driving off road to park or incidental road maintenance work that occurs just off the road prism. These activities off the road prism generally occur with the first 30-50 feet. To analyze potential impacts to sensitive plants we will double this distance to 100 feet to ensure any impacts to sensitive plant populations will be considered.

Analysis Method/Bases of Analysis:
For effects analysis of the various alternatives, the project area and cumulative effects area is defined as the boundary of the Madison Ranger District.

Effects Common to All Alternatives:
All alternatives have the same number of sensitive plant species and populations growing within one hundred feet of an open motorized route. Those routes with adjacent sensitive plant populations are main access routes and were not considered for closing to motorized use. Motorized use and maintenance of roads or trails does not affect any sensitive plant populations. Closing of a motorized route or a change in maintenance level has no affect on sensitive plant populations.

Direct and Indirect Effects:
The direct and indirect effect of wheeled motorized travel routes adjacent to sensitive plant populations are tied directly to the physical effects of plants being crushed or soil disturbed by vehicles. No sensitive plant populations on the Madison Ranger District are known to grow in road or trail prisms. Impacts may come from vehicles driving off road to park or incidental road maintenance work that occurs just off the road prism. All six sensitive plant species with populations within 100 feet of an open motorized route show no evidence of impact from road or trail use. All sensitive plant populations are in healthy plant communities. Individuals show high vigor and show no impacts from motorized vehicle use.

Cumulative Effects:
Vegetation Management: Timber harvest would restore some early successional vegetation stages within the area. It would also help to restore and maintain aspen within the Gravelly Range. This change in vegetation has had or would have very limited effect on sensitive plant species.

Grazing: Current trends in range management are for an improvement in riparian conditions. Grazing management updates will be designed to improve riparian areas and maintain or improve upland conditions. This will generally result in the same or fewer numbers of livestock and maintaining or shortening the season of use. Improvements in riparian areas and reduction of livestock impacts has and will have a beneficial effect for sensitive plant species.

Noxious Weeds: Establishment and the unchecked expansion of noxious weeds into a plant community have major negative effects. Aggressive weeds can out compete native plant species and slowly dominate a site. Plant communities lose their natural diversity in species and structure along with becoming less able to recover from natural disturbances. Sensitive plant species, due to their limited occurrence, can be greatly affected by noxious weeds. Not only may the noxious weed out compete the sensitive plant but inappropriate weed control measures may destroy individuals or eliminate populations. Current noxious weed infestations on the Madison Ranger District are mapped (see Project Record). Primary concern species include *Centaurea maculosa*, *Cynoglossum officinale, Linaria vulgaris* and *Carduus nutans*. The District has an ongoing aggressive noxious weed control program that emphasizes prevention, early detection and eradication of new small infestations. Current and planned noxious weed control does not negatively impact sensitive plant species. The program benefits sensitive plant species by containing and reducing the coverage and density of current noxious weed infestations. The program also benefits sensitive plants by preventing the establishment of new noxious weed infestations into weed free areas.

Prescribed Burning: Prescribed burning would restore early successional vegetation stages within the area along with restoring various plant species such as aspen. In communities where prescribed burning has and may be used the native plant species have evolved with fire. The affects of fire on plants and the soil are such that most plant species generally benefit from this sort of disturbance. There would be very limited effect on sensitive plant species, primarily beneficial, due to prescribe burning.

Record of Decision Enacting Forest Plan Travel Management Direction for Certain Areas of the Beaverhead-Deerlodge National Forest (ROD 2): This decision closed 32.9 additional miles of routes to motorized vehicle travel. No sensitive plant populations on the Madison Ranger District are known to grow in road or trail prisms. There would be very limited effect on sensitive plant species by this decision. Any effects would be tied to the reduction of potential introduction or spread of noxious weeds.

Summary of Effects:
Actions allowed under this alternative have no effect on Beaverhead-Deerlodge sensitive plant species. With no effect on sensitive plants the standard is met as sensitive plant populations are maintained. The additional 32.9 miles of road closed through ROD 2 do not change this assessment.

Comparison of Alternatives:
Item of Comparison - Number of known sensitive plant species occurring within 100 feet of a road/trail open for wheeled motorized use.

For all alternatives, there are six species that grow within 100 feet of a road. These roads are main roads and proposed to remain open to motorized travel. These species and their populations are the same as those in Alternative B, B Modified, and C. The additional 32.9 miles of routes closed through ROD 2 does not change this assessment.

Heritage

Historical Context
The remains of approximately 12,000 years of human history and prehistory are spread across the Beaverhead-Deerlodge National Forest. Many of these archaeological and historic sites are important for the scientific, historic, cultural, and aesthetic values they possess. For a detailed narrative of the prehistoric and historic culture history and cultural/historic context relating to the Beaverhead Unit of the Beaverhead-Deerlodge National Forest (including the current analysis area) see the Oil & Gas Leasing FEIS of the Beaverhead National Forest (USDA 1995a) and the Beaverhead-Deerlodge Forest Land and Resource Management Plan, FEIS (USDA 2008).

The most common type of prehistoric site in southwestern Montana is the lithic scatter, a site which contains stone tools, and/or flakes of stone left during the process of making or repairing a stone tool, such as a knife, arrow point, spear point, or hide scraper. Lithic scatters may represent the remnants of prehistoric tool manufacturing/maintenance locales, hunting camps, animal butchering sites, or stone quarries. The ubiquitous lithic scatter comprises approximately 70% of recorded prehistoric sites in this part of the state. Other prehistoric site types in western Montana include bison jumps, game traps, tipi ring encampments, vision quest sites, wickiups, and rock art sites, among others.

The most common type of historic cultural resource relates to the mining of gold, silver, lead, and copper during the latter part of the 19th century and the early part of the 20th century. Such properties include mining camp remnants, ghost towns, miners' cabins, mining shafts, adits, mills, smelters, and an assortment of other mining related buildings, structures, and landscape features.

Gold prospectors and a few early settlers began moving into southwestern Montana following the demise of the fur trapping industry. The first wave of mining began in the early 1860s and lasted for about the next 20 years focusing on the mining of placer gold gravel deposits along larger streams and drainages. This was followed by lode, or hard rock, mining of bedrock of gold, silver, and then copper deposits.

By World War I the mining of hard rock gold was essentially over, although some small ventures continued. A revival occurred during the Great Depression era of the 1930s when the price of gold almost doubled. Overnight, the gold mining streams and fields were once again sluiced and mined with pick and shovel. Unlike before though, this was done by out-of-work miners and others who were trying to eke out some sort of livelihood during the harsh economic times of the Great Depression. The Great Depression mining era closed at the outbreak of World War II. Gold mining continues today, generally by large corporations who mine for so-called "flour" gold. The mining of this type of gold requires tons of earth to be removed and the use of highly sophisticated processing techniques in order to retrieve a few ounces of the precious yellow metal. Other historic period sites include transportation networks, lumber mills, homesteads, forgotten cemeteries, irrigation ditches, cow/sheep camps, and trash dumps.

The Beaverhead-Deerlodge Forest recognizes that tribal governments are sovereign nations with a strong interest in National Forest System land management and identifies the need to support treaty rights and tribal values when planning and implementing forest management activities. The Shoshone-Bannock Tribes of the Ft. Hall Reservation and the Confederated Salish and Kootenai Tribes of the Flathead Reservation maintain active interests in the southwestern Montana. Individual tribal members occasionally use public lands to gather plants or other native materials, cut tipi poles, and hunt or fish. However, these groups have been removed from the area for so long; they are gradually losing the historical and cultural ties to locations that are distant from their current

reservations. Continuing consultation efforts with these groups have yet to identify specific traditional cultural properties (TCPs) or areas of religious significance within the proposed project area. They have, however, expressed concerns over the preservation and protection of specific archaeological sites (burial locations and pictograph sites) and any adverse impacts to such sites, though none are currently known to occur in project area.

Within a regional perspective, the development of private lands that are not protected by federal or state cultural resource statutes and regulatory protections decrease the broader resource base, which then affects the understanding of these resources and potentially limits management options. It is reasonably foreseeable that heritage resources found on the Forest will increase in value and significance as prehistoric and historic sites in other non-federal ownerships are damaged or destroyed by development or other activities. Restrictions on recreational activities in other areas, population growth, resource extraction, and development can increase the use intensity within the planning area, potentially affecting cultural resources. The coordination of regional planning actions could aid in the continued and future protection of cultural resource values.

Existing Condition

Over the past 40 years, numerous cultural resource inventories have been conducted within the Madison District primarily in advance of various Forest undertakings including timber sales, range improvement projects, and recreational developments. To date, approximately 17,514 acres (2%) out of the nearly 720,900 acres of forest land within the Madison District have been inventoried for cultural resources. As a result of the inventory over 325 cultural properties have been identified and recorded. Of the 325 recorded cultural properties, 147 (45%) are located within ¼ mile of motorized travel routes identified as the existing situation in Alternative A. These sites include both historic and prehistoric properties and run the full gamut of site types from prehistoric lithic scatters and camp sites, to historic mining sites and historic forest service trails and administrative facilities. A majority of the sites were initially recorded 30 years ago; only a small percentage of the recorded sites have been revisited or monitored within the last 15 years. A majority of the identified properties have not been formally evaluated for eligibility to the National Register of Historic Places.

Of the total miles of motorized routes identified in the proposed alternatives, approximately 11% are included within areas that have been inventoried for cultural resources.

Table 46. Cultural Resource Survey Status All Alternatives Summary

Table 46. Cultural Resource Survey Status All Alternatives Summary			
Alternatives	Total Miles of Motorized Routes	Miles of Motorized Routes with Cultural Resource Surveys	Percent of Motorized Routes Surveyed
A	802.3	85.8	10.7%
B	766.6	83.4	10.9%
B mod	765.0	84.9	11.1%
Alternative C	787.0	84.7	10.8%

Table 47. Cultural Resource Survey Status for Alternatives B and B Modified

Table 47. Cultural Resource Survey Status for Alternatives B and B Modified							
	Alternative B				Alternative B modified		
Route Category	Total Miles of Motorized Routes	Miles of Motorized Routes with Cultural Resource Surveys	Percent of Motorized Routes Surveyed		Total Miles of Motorized Routes	Miles of Motorized Routes with Cultural Resource Surveys	Percent of Motorized Routes Surveyed
add dispersed site access to system as trail	6.7	0.4	5.9%		6.6	0.4	5.5%
add unauth road to system	1.8	0.4	22.8%		1.9	0.5	26.0%
add unauth trail to system	3.6	0.1	1.6%		3.6	0.1	1.6%
change VT/SOU	47.3	4.5	9.5%		116.8	12.3	10.5%
close system road	18.7	1.6	8.4%		22.0	2.0	9.1%
close system trail	9.9	0.0	0.1%		9.9	0.0	0.1%
close unauthorized road	3.3	0.3	8.2%		3.4	0.3	8.9%
convert to trail	93.6	15.5	16.5%		77.8	9.9	12.8%
decommission system road	4.2	0.4	9.0%		4.2	0.4	9.0%
no change from alt A	615.4	63.0	10.2%		558.3	59.1	10.6%

There are 66 recorded cultural properties (20% of the recorded sites in the Madison District) located within the right-of-way of motorized routes identified as the existing condition in Alternative A (see Table 1 in Heritage report). Of the 66 sites, 26 (39%) are prehistoric, 38 (58%) are historic and 2 (3%) are multi-component exhibiting both historic and prehistoric occupations. Prehistoric sites are primarily represented by small dispersed lithic scatters (19), lithic scatters with fire-cracked rock (4), lithic scatters with features (2), and one site identified as a prehistoric quarry. The recorded historic sites are primarily related to historic mining activities that contain cabins and/or mining features (27), historic Forest Service Administrative cabins (8), historic cabins of unknown purpose (2), and one site described as an historic dam. The two multi-component sites are represented by prehistoric lithic scatters overlain by historic mining activities (cabins and features). Of all the known recorded sites only seven have been formally evaluated for significance in consultation with the Montana State Historic Preservation Office, six of which were determined to be eligible for the National Register of Historic Places (24BE1335, 24MA105, 24MA572, 24MA665, 24MA1203, 24MA1205, 24MA1206, 24MA1207, 24MA1208, and 24MA1209), and one site determined not eligible (24MA1000).

The known archaeological sites have been recorded over the past 40 years. Only a handful of the recorded sites have been subsequently revisited or monitored since they were originally recorded. The

original site forms of the 65 cultural properties identified within the right-of-way of motorized routes were closely examined for reference to adverse impacts occurring at the site location. As originally described on the site form, no adverse impacts were noted at 11 (17%) of the recorded sites. Natural erosion and/or decay were noted at 32 (48%) of the site locations and 15 sites (23%) were noted as having been impacted by previous road construction. The remaining sites were identified as having been impacted by other miscellaneous construction (5-8%) and vandalism/recreational impacts (3-4%).

Within the Madison District, there are currently two, as yet "informally" defined archaeological districts. The Black Butte Archaeological District and the Monument Ridge Archaeological District have been highlighted due to the presence of significant cultural resource values associated with the extraction and utilization of naturally occurring chert rock for tool manufacture. Currently there are no cultural landscapes or traditional cultural properties (TCPs) that have been identified.

The Forest Service is charged with identifying, evaluating, preserving and enhancing significant heritage resources found on National Forest lands in accordance with relevant federal legislation and manual guidance (USDA 2008b). Heritage resources are nonrenewable and include archaeological and historic sites, districts, and cultural landscapes. Heritage properties of traditional cultural value (TCPs) to American Indian and other cultural groups also occur. The effect of any management action which adversely impacts heritage properties reduces the total heritage resource base across the Forest. Once they are destroyed, or allowed to deteriorate, there is no possibility to recover the scientific, cultural, educational and aesthetic values embodied in cultural places and things. The inherent nature of these resources (i.e. nonrenewable) means that the trend is inevitably downward. Natural conditions including erosion, natural deterioration or decay, impacts from animal and human disturbance all work to reduce the number and integrity of heritage sites.

Past activities have influenced heritage resources reducing the integrity of specific resources or have led to their loss altogether. Vandalism of historic mining cabins, removal of weathered wood for decorative use elsewhere, collecting arrowheads or other historic artifacts and disturbance of artifacts and lithic scatters through ground disturbing activities disturb and/or remove the resource. Because these are historic or archaeological resources, once disturbed or removed, the integrity of the site is lost.
Public education about heritage resources and compliance by land management agencies with regulatory requirements to protect known sites has reduced the incidence of actions leading to the loss of a heritage resource. However, this type of action, intentional and unintentional, is expected to continue to some degree.

Currently, the BDNF completes a heritage resource survey of the area influenced by a ground disturbing activity to determine if a site is present prior to implementation. If a previously unknown site is found, it is recorded and impacts are avoided or mitigated. This action is also expected to continue.

Effects Analysis

Resource Factors to be Analyzed and Units of Measure:
Factors: Physical remains of past human activities

Metrics: Listing, eligiable, or undetermined status for National Register of Historic Places.

Heritage/Cultural Resources - are the physical remains of past human activities (e.g., artifacts, burials, pictographs, Native American ceremonial sites, and the remains of mining, logging, ranching and

other historic activities) that are listed on the National Register of Historic Places, have been determined eligible for the National Register of Historic Places, and those where formal determinations of eligibility are as yet "unresolved".

Analysis Method/Bases of Analysis:

Methodology:

Information used in this analysis comes from a Cultural Resources Class I overview of existing information on file. Our knowledge about the occurrence and distribution of heritage resources come from the National Register of Historic Places, the Montana State Historic Preservation Plan, the Beaverhead-Deerlodge National Forest Master Site/Survey Atlas, previous archaeological survey reports, General Land Office plats, Homestead Entry Survey records, Mineral Survey records, Land Status records, historic Forest Service maps, historic county maps and aerial photographs. A wide range of other historic, ethno-historic, archaeological and anthropological references were also reviewed to gain the widest possible understanding of historic land use and site occurrence across the Forest. The heritage program electronic GIS database is substantially complete for previous surveys, and recorded prehistoric and historic properties, on both the Beaverhead and the Deerlodge units. All statistics related to heritage surveys and sites displayed in this document are derived from the Master Site/Survey Atlas and/or GIS database. A valid assessment of the existing condition of heritage resources is hampered because information derived from site record forms varies in completeness and quality. Field records from the 1970's and early 1980's are sometimes incomplete and difficult to compare to information collected to a higher standard in a more comprehensive manner over the last 15 years. In addition, this analysis was conducted in accordance with draft policy for NHPA Compliance in travel management (USDA Forest Service 2005) and Region 1 travel planning guidance for the Heritage Program (USDA Forest Service 2009b).

Spatial and Temporal Context for Effects Analysis:

In order for an assessment of the direct impacts that may be anticipated as a result of the implementation of the proposed alternatives, the number and type of known cultural resources within the specified road/trail rights-of-way in the Madison District were examined. Anticipated direct effects would include any surface disturbing activities (i.e., maintenance of newly designated system roads or trails) associated with the implementation of this project. For potential indirect impacts resulting from increased visitor and increased potential for site vandalism, the number and type of sites located within ¼ mile of identified roads and trails were also examined by alternative. The results of the analysis are presented in Table 2 in the Heritiage report. There are no statistical differences either in the number or type of cultural resources (within the road right-of-way, or within ¼ mile of designated routes) between the alternatives presented. The temporal period for the effects analysis takes into account the cumulative effects of all actions up to the present.

Effects Common to All Alternatives:

Indirect Effects:

Population trends and visitor use statistics (USDA FS 2008:342-347) indicate that the Forest will receive increasing levels of visitor use from local residents and tourists. Experience shows that heritage site vandalism and site looting increase as Forest visitation increases. Construction, reconstruction and routine maintenance of campgrounds, roads, trails and other developed facilities may adversely affect heritage resources. Both prehistoric and historic heritage resources are often found in locations considered optimum for recreation development. Dispersed recreation can also lead to adverse impacts to heritage resources. Dispersed camp sites are often located on prehistoric sites. Campers may use logs from historic cabins for fire wood, backstops for target shooting and otherwise vandalize standing structures. Snowmobilers have been known to use the roofs of cabins as snowmobile jumps when the snow is sufficiently deep. The proliferation of OHV use, even in settings where riders are required to remain on designated routes, has and will continue to lead to the

degradation of heritage resources. OHVs have opened areas of the Forest to visitation at levels never seen before, or in some cases rarely seen at all. Evidence and experience shows that heritage sites within ¼ miles of trails are more prone to vandalism than those sites in isolated and inaccessible areas. As noted above, there are currently 147 recorded cultural/historic properties within ¼ mile of identified roads and trails. Many trails and roads are more than 50 years old and historic resources in their own right, though few have been formally recorded within the proposed project area. Abandonment, reconstruction and changes in use patterns can adversely affect these resources.

Cumulative Effects:
Most heritage resources are location specific, fragile, and nonrenewable. Therefore, cumulative impacts could occur through incremental degradation of the resource base from a variety of sources reducing information and interpretive potential or affecting values important to Native American communities. The importance of heritage sites is often enhanced by their context in a larger landscape beyond the immediate physical boundaries of individual sites. Large scale changes to landscapes, whether immediate or cumulative, could adversely affect significant heritage properties. Measures are in place to identify threats to resources and to prioritize management actions; nevertheless, some impacts are unavoidable.

Processes of natural deterioration and decay, can seriously affect the integrity of historic properties with wooden structural remains. Natural erosion can also affect the integrity of prehistoric sites with buried cultural deposits of scientific value. There would continue to be impacts on NHRP-eligible, unevaluated and undiscovered cultural resources associated with unauthorized activities such as OHV use off of designated roads and trails, dispersed recreation, and vandalism. Unauthorized activities, dispersed activities, and natural processes could cause unmitigated impacts on NRHP-eligible resources and/or traditional use areas that would exceed the significance threshold for impacts on cultural resources, (i.e., adversely impact the integrity of the property which may affect it's eligibility for inclusion to the National Register of Historic Places). Non-project related heritage inventories, annual site monitoring, the identification of significant heritage sites, and the preservation and protection of those significant heritage sites can reduce the downward trend in the heritage resource base and lessen cumulative effects from management activities.

Other regional resource, land use, and economic development planning efforts can affect the types and intensity of uses within the planning area and can affect the regional resource base. Development of lands that are not protected by federal or state cultural resource statutes and regulatory protections could decrease the regional resource base or lead to loss of Native American resources, affecting the understanding of these resources and potentially limiting management options within the planning area. It is reasonably foreseeable that heritage resources found on the Forest will increase in value and significance as prehistoric and historic sites in other non-federal ownerships are damaged or destroyed by development or other activities. Restrictions on recreational activities in other areas, population growth, resource extraction, and development can increase the use intensity within the planning area, potentially affecting cultural resources. Coordinating with these regional planning actions could aid in the continued and future protection of resource values.

The Record of Decision Enacting Forest Plan Travel Management Direction for Certain Areas of the Beaverhead-Deerlodge National Forest (ROD 2) reduced open motorized routes on the Madison Ranger District by 32.9 miles. Closure of these additional roads and trails to motorized vehicle use will in general reduce potential indirect impacts to any cultural resources that may occur on or in close proximity to these routes, and therefore have an overall beneficial effect to these resources. There are three cultural properties located within ¼ mile of roads closed by ROD2 (24MA485, 24MA951 and 24MA1057), one of which is also within the right-of-way of a ROD2 road (24MA485).

Alternative A (No Action)

Direct Effects: None
Indirect Effects: Common to all Alternatives (see above)
Cumulative Effects: Common to all Alternative (see above)

Alternative B (Proposed Action)

Direct Effects: None (see Mitigation/Design Features below)
Indirect Effects: Common to all Alternatives (see above)
Cumulative Effects: Common to all Alternatives (see above)

Alternative B Modified (Modified Proposed Action)

Direct Effects: None (see Mitigation/Design Features below)
Indirect Effects: Common to all Alternatives (see above)
Cumulative Effects: Common to all Alternatives (see above)

Alternative C

Direct Effects: None (see Mitigation/Design Features below)
Indirect Effects: Common to all Alternatives (see above)
Cumulative Effects: Common to all Alternatives (see above)

Scenery

Existing Condition

The existing condition of the project area is described in terms of Landscape Character, Scenic Attractiveness, Visibility, Existing Scenic Integrity, and Visual Absorption Capability.

A. Landscape Character

Landscape Character is defined as "an overall visual and cultural impression of landscape attributes – the physical appearance and cultural context of a landscape that gives it an identity and 'sense of place'" (USDA 1995, p. 1-2). The following characterizations were developed from landscape analyses conducted by the Beaverhead-Deerlodge NF during the late 1990s and early 2000s.

Character of the Gravelly Landscape:

The following describes the scenic character of the Gravelly Landscape. An additional description of the landscape can also be found in the Forest Plan (RFP p. 127). The Gravelly Landscape includes four mountain ranges: the Ruby Range, the Blacktail Mountains, the Snowcrests, and the Gravellys, and part of the Centennial Range. River valleys that separate these mountain ranges are Red Rock River (the southern most Centennial Valley and north along Interstate 15 from Lima to Clark Canyon Reservoir on the east), the Ruby River and Valley, the Madison River and Valley, Blacktail Creek, and the Beaverhead River. The spacious landscape includes broad natural grasslands and farmlands, ranging from three to ten miles across, with rivers that meander along their floodplains. Foothills provide a gradual ascent to mountains, with the transition from agricultural lands, grasslands, and sagebrush to forested lands lies in an irregular line along the foothills. A mosaic of Douglas-fir forests, lodgepole pine forests, aspen groves, meadows, and rock outcrops provides outstanding visual variety and contrast with the river valleys below and dramatic rocky peaks above.

Rural homes, ranchettes, and small subdivisions are visible, primarily in the Ruby and Madison River Valleys and foothills of this landscape. Areas altered by historic mining are evident throughout the landscape, especially near Alder Gulch. Mining and mining history from the 1860s forward are a dominant part of the landscape appearance.

The Centennial Valley and Centennial Range south to the Continental Divide retain a high level of inherent scenic attractiveness, partly attributed to a concentration of lakes and wetlands including the Red Rock Lakes Wildlife Area, established for the protection of trumpeter swans. Deep winter snows have etched broad vertical avalanche chutes in the faces of the Centennial Mountains. Timber harvesting is slightly evident; however, design and natural visual variety have made it possible to harvest the timber in such manner that it blends well with the surroundings. Ghost houses and barns remain as a reflection of the community of ranchers who once settled the Centennial Valley.

The Snowcrest Range, positioned between the Ruby River, the Centennial Valley, and the Blacktail area, is a single row of steep rocky peaks and saddles banded by coniferous forests between the peaks and the sagebrush grasslands below. Some of the drainages from these peaks are lined with deciduous shrubs, such as willow in the lower portions. Aspen patches and meadows are also common in the forested areas. This range is natural appearing and high in inherent scenic attractiveness.

The Gravelly Range divides drainage to the Centennial Valley and its Red Rock River on the south, the Ruby River on the West, and the Madison River on the East. This mountain range is typified by a large mosaic of grasslands, lodgepole, Douglas fir and aspen groves. Large Rocky Mountain Juniper is common, particularly as one drives into the range in transition from sagebrush to forested lands from the Ruby Valley. Slopes tend to be gentle, though some steeper slopes and ridges are present. One landform feature here is Black Butte, a butte near the center of the range so named for the dark

rock and dark trees that cover its surface. Another is Monument Ridge, a long grassy ridge used for ceremony by tribes for centuries and for navigating by sheepherders in settler times. Lodgepole and Douglas-fir forests along the northern portion and interior southeast corner have been extensively harvested. Remnants of mining for talc, gold, gypsum, gravel, iron, and other minerals is also a dominant feature in several isolated places within the mountain range. Overall the range is natural appearing to pastoral and a high level of scenic integrity exists, with isolated areas where the integrity is moderate to low. The sense of vastness so characteristic of southwest Montana is exemplified in views from the Gravelly Range road. Further definition of the Ruby River Valley and the Beaverhead Valley are provided by the Ruby Range and Sweetwater bench lands along the northwestern corner of the Gravelly Landscape Analysis Area, consisting of Douglas-fir and lodgepole pine forests interspersed with large meadows. Ranches are widely spaced through this sagebrush bench land.

An area southwest of Dillon includes the Blacktail Range, Blacktail Creek and the Blacktail Wildlife Management Area, and the dry hills draining to Sage Creek. The Blacktail Range is a small mountain range with peaks covered by conifer forests interspersed with large grassland areas. Timber has been harvested in patches across this range. Within the Blacktail drainage private lands are used for sheep and cattle ranching while state and federal lands are used for supplemental grazing.

A network of roads and trails are located throughout these ranges, used for recreation, accessing permitted grazing areas, timber harvests, and historic mining. Refer to other specialist reports for more detailed discussion regarding these transportation uses.

Character of the Madison Landscape:
The following describes the scenic character of the Madison Landscape. An additional description of the landscape can also be found in the Forest Plan (RFP, p. 197). The Madison Range is a generally natural appearing landscape with some clear-cut sections, one major development cluster, a few linear areas of commercial and residential development, and a few areas of rustic structures. The terrain generally varies from lower hills with interspersed open meadows, to steep sided canyons and rugged sharp peaks. Vegetation varies dramatically including willow bottoms, mixed deciduous/coniferous bands along rivers, dense coniferous tree cover on steep slopes, mixtures of open grass meadows and coniferous bands, and open alpine meadows. In places, there are entire hillsides of continuous evenly textured, dense coniferous stands with no visual variations. These are often even-aged stands that are the result of an earlier stand replacing fire.

Private development are located mostly along the valleys and valley edges. The Big Sky development and Madison west side ranchettes tend to dominate the visual character of the immediate area. This is due to their location and the fact that few structures borrow design features from the surrounding landscape or traditional western rustic architecture. The Taylor Fork end of Gallatin Canyon has structures that are more rustic in overall appearance and do not dominate their setting.
Where visible in the immediate foreground (0 - 300 feet), foreground (300 feet - 1/2 miles) or middleground (1/2 mile - 4 miles) of forest roads and trails, Man-made alterations vary in their level of visual dominance depending on their range of shapes, edge treatments, and interior treatments, with some dominating the scenery. These include old clear cuts, skid roads, slash piles and high stumps, graded roads with visible cut and fill slopes, landings and staging areas for logging, both on private and National Forest land. These areas include the logged and roaded sections of Taylor Fork, West Fork Drainage, Buck Ridge, Jack Creek, and some areas along Teepee Creek Road. More natural looking areas also exist with broken-up edge patterns, natural openings, varied herbaceous and woody regrowth, shrubs and trees. The ski runs at Big Sky are somewhat visible from almost everywhere in the Big Sky drainage; however, they do not dominate the viewshed, except when viewed from the base lodge area. The golf course is in the heart of the modern looking developed area and is situated in what would otherwise be open, shrub/grass meadow.

Character of the Tobacco Root Landscape:
The following describes the scenic character of the Tobacco Root Landscape. An additional further description of the landscape can also be found in the Forest Plan (RFP, p. 221). The Tobacco Root Landscape consists of a single island mountain range, including steep rocky peaks that are commonly snow covered for 10 to 12 months each year. These peaks rise above mid-elevation forests which give way to sagebrush grasslands. In background, the transition from forest to grassland is one of the most dominant features, along with the jagged tops of the mountains against the skyline. Peaks that are dominant forms on the horizon include Old Baldy Mountain, Ramshorn Mountain, Ward Peak, and Hollowtop Mountain. Views within the Tobacco Roots range from those confined to narrow stream bottom areas or heavily forested sites, to open grasslands. Views from high mountain peaks look over the agricultural valleys below and to other mountain ranges beyond.

Old clearcuts in the Mill Gulch and the North Meadow Creek area are visible from Highway 287. Remnants of mining from the 1860s forward can also be seen throughout the area. These activities are only dominant when viewed closely such as from roads or campgrounds.

B. Scenic Attractiveness
Scenic Attractiveness is the "primary indicator of the intrinsic scenic beauty of a landscape and of the positive responses it evokes in people. It helps determine landscapes that are important for scenic beauty, based on commonly held perceptions of the beauty of landform, vegetation pattern, composition, surface water characteristics, and land use patterns and cultural features" (USDA 1995, p. 1-14).
Scenic Attractiveness is measured as Class A (Distinctive), B (Typical), or C (Indistinctive). Class A includes areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality *within the landscape character*. Class B (Typical) contains areas in which the natural and cultural features combine to create ordinary or common scenic quality, and Class C (Indistinctive) contains those areas where natural and cultural features (or the lack thereof) combine to provide low scenic quality. The frame of reference for scenic attractiveness is the landscape character description above (see USDA 1995, p. 1-16).

Upon review of the Scenic Attractiveness mapping completed as part of the Forest Plan, the landscapes described above consist largely of areas of Class B (Typical) scenic attractiveness, with other areas identified as Class A (Distinctive) and Class C (Indistinctive). The Class A areas typically correspond with the exposed higher elevation peaks and areas of the prominent ranges, as well as drainages and other areas exhibiting a combination of vegetation, topography, water, and/or rockform, resulting in a pleasing natural scene. The Class C areas generally include low-lying sage and grass slopes and foothills.

C. Visibility
The project area is visible from several Concern Level (CL) 1 and 2 sites and routes identified in the Forest Plan. Many of those routes are contained within the project area. Concern Levels represent a method of categorizing the importance of scenic resources to Forest visitors. Concern Level 1 travel routes and use areas are those that are nationally or regionally important locations associated with recreation and tourism use, where there is a high interest in scenic resources (USDA 1995). These include:

- Paved highway sections across and within 15 miles of the Forest boundary, including Interstates, Federal and State highways, forest and county roads and other jurisdictions.
- All designated National Historic, Scenic, and Recreation trails, National Scenic and Backcountry Byways, National Landmarks and Historic Sites.
- All National Forest Campgrounds
- All State Parks and Campgrounds

- All incorporated towns
- All eligible Wild, Scenic, and Recreation rivers
- Developed Campgrounds and Recreation Resorts

Concern Level 2 routes are those that are locally important and are associated with recreation, and where there is a high to moderate interest in scenic resources. These include:

- All Forest Service Trailheads
- Forest Service Cabins and Administrative Sites

All remaining roads and unnamed trails would be Concern Level 3 travel routes, which receive low use and where users have a moderate to low interest in scenic resources. Table 48 lists Concern Level 1 and 2 routes and sites contained within the project area or from which the project area is visible.

Table 48. Scenery Concern Levels 1 and 2

Gravelly Landscape: Madison Ranger District		
	Route or Site	Extent of Concern
Concern Level 1	Interstate Highway 15	Red Rock to Monida Pass
	State Highway 287	Sheridan to Silver Star
	US Highway 287	Norris to Quake Lake
	State Highway 87	US Highway 287 to Henry's Lake ID
	Madison County 248 Ruby River Road	Alder to Ruby Reservoir
	Blacktail Road	Dillon to Centennial Valley Road
	Southside Centennial Valley Road	Monida to Henry's Lake ID
	Madison River	Earthquake Lake to Norris
	Continental Divide National Scenic Trail	Hellroaring Creek to Raynolds Pass
	Highway 41	Twin Bridges to Dillon
	Interstate Highway 15	Red Rock to Monida Pass
	State Highway 287	Sheridan to Silver Star
	US Highway 287	Norris to Quake Lake
	State Highway 87	US Highway 287 to Henry's Lake ID
	Madison County 248 Ruby River Road	Alder to Ruby Reservoir
	Blacktail Road	Dillon to Centennial Valley Road
	Southside Centennial Valley Road	Monida to Henry's Lake ID
	Madison River	Earthquake Lake to Norris
	Continental Divide National Scenic Trail	Hellroaring Creek to Raynolds Pass
	Highway 41	Twin Bridges to Dillon
	Interstate Highway 15	Red Rock to Monida Pass
	All towns along highway concern extents	
	Ruby Reservoir Recreation Area	
	Cottonwood Campground	
	Earthquake Lake Recreation Area	

Gravelly Landscape: Madison Ranger District	
	West Fork Madison Rest Area
	Cliff and Wade Lakes Recreation Complex
	Elk Lake Recreation Area
	Madison River Recreation Area
	Red Rock Lake National Wildlife Refuge

Gravelly Landscape: Madison Ranger District		
	Route or Site	Extent of Concern
Concern Level 2	Blacktail Road	Price Creek to the Centennial Valley Road
	Ruby Road (Centennial Divide Road)	Ruby Reservoir to the Centennial Valley Road
	North Side Centennial Valley Road	Blacktail Road to Forest Road 8384
	Forest Road 8384 Elk Lake Road	North Side Centennial Valley Road to Elk Lake
	Forest Road 163 Warm Springs Road	Ruby River Road to Forest Road 290
	Forest Road 347	Ruby River Road to Eureka Basin
	Forest Road 290 Gravelly Range Road	Eureka Basin to Forest Road 292
	Forest Road 237 Standard Creek Road	Forest Road 209 to Forest Road 290
	Forest Road 209 West Fork Road US Highway 287 to Little Elk River	
	Forest Roads 292 Call Road and county connecting road	Ennis to Forest Road 290
	County Road 122 Horn Creek Road	State Highway 87 to Cliff Lake
	Forest Road 572	US Highway 287 to Wade Lake
	Forest Road 8386A	Forest Road 572 to Cliff Lake
	Forest Road 325	Blacktail Road to Antone Station
	Snowcrest Trail segments 603 69 and 670	Vigilante to Antone Station and to Peterson Basin
	Divide Trail 61	Divide Administrative Site to Snowcrest Trail
	East Fork Blacktail Trail 69	East Fork Blacktail Road to Snowcrest Trail
	Hidden Lake Trail 35	Elk Lake to Cliff Lake
	Lobo Mesa Trail 405	Forest Road 290 to West Fork Trailhead
	Forest Road 1206 Elk River Jeep Trail	Forest Road 209 to Forest Trail 79
	Hidden Lake	
	Otter Lake	
	Goose Lake	

Madison Landscape: Madison Ranger District		
Concern Level 1	Route or Site	Extent of Concern
	US Highway 287	Earthquake Lake Visitor Center to Norris
	State Highway 287	Ennis to Madison Overlook
	Bear Creek Trailhead	

Madison Landscape: Madison Ranger District		
Concern Level 2	Route or Site	Extent of Concern
	None identified	

Tobacco Root Landscape: Madison Ranger District		
Concern Level 1	Route or Site	Extent of Concern
	Interstate Highway 90	Homestake Pass to Three Forks
	US Highway 287	Cameron to Three Forks
	State Highway 287	Ennis to Twin Bridges, and communities
	State Highway 41	Dillon to State Highway 2, and communities
	State Highway 55	Whitehall to Highway 41, and Whitehall
	State Highway 2	Pipestone Pass to Three Forks
	Highway 359	Interstate 90 to U.S. 287
	Madison Co Highway 283	Harrison to Pony, including communities
	Forest Road 107, South Boulder Road	Highway 359 to Mammoth
	Madison Co. and Forest Road 111	Sheridan to Upper Branham Lake
	Lake Louise National Recreation Trail	Forest Road 107 to end of trail
	Lost Cabin National Recreation Trail	Forest Road 107 to end of trail
	Jefferson River	Twin Bridges to Three Forks
	Madison River	Cameron To Bear Trap
	Towns along Interstate 90, and Highways 2, 287, 41, and 84 Pony, Mammoth, Mill Creek Campground and Day Use Balance Rock Campground and Day Use Branham Lakes Campground Ennis Lake Recreation Complex Potosi Campground	
Concern Level 2	Forest Road 107, South Boulder River Road	Mammoth to Brannan Lakes
	Forest Road 160 and Madison Co. connecting road, N. Meadow Cr. Road	McAllister to Sure Shot Lakes

Tobacco Root Landscape: Madison Ranger District		
	Forest Road 1221 and Madison Co. connecting road, S. Meadow Creek Road	McAllister to South Meadow Creek Lake
	Forest Road 160 and Madison Co. connecting road, S. Willow Creek Road	Pony to Potosi Campground
	Forest Trail 301	Pony to Hollow Top Lakes
	Forest Trail 338 and 366 and Forest Road 965	Forest Road 160 to Lupine and Twin Lakes

D. Existing Scenic Integrity
"Scenic Integrity indicates the degree of intactness and wholeness of the landscape character…Landscape character with a high degree of integrity has a sense of wholeness, intactness, or being complete" (USDA 1995, p. 2-2). Scenic integrity can describe an historic state, an existing state, or a short- or long-term goal. In this discussion, the scenic integrity refers to the existing condition.

Depending on visibility and viewing distance, the "degree of intactness and wholeness of the landscape character" varies. In general, in foreground views from some Concern Level 1 and 2 routes and sites, the effects of past and on-going activities are visible and may even dominate views. In middle- and background views, effects are often reduced by distance and vegetation and topographic screening.

The project area has been affected by human activities, including the existing roads and trails considered under this project. The visual impacts resulting from those activities are visible in the landscape from some of the Concern Level 1 and 2 routes and sites identified above. These activities include timber harvest, mineral extraction, fire suppression, grazing, road construction, facility construction (including buildings, communication sites, and transmission lines), developed and dispersed recreation sites and trails, and residential development.

E. Visual Absorption Capability
"Visual Absorption Capability (VAC) indicates the relative ability of any landscape to accept human alteration without loss of landscape character or scenic condition" (USDA 1995, p. C-1). In this discussion, VAC relates primarily to the physical characteristics of the landscape. The primary factors that contribute to VAC are slope, vegetation, and soils and geology.

The analysis below will be primarily described in terms of Scenic Character, Integrity, and Visibility.

Consistency with Forest Plan
This project proposes route designations that are administrative in nature. There is no physical action on the ground proposed, therefore nothing adverse to these objectives and standards of the RFP, is proposed.

Effects Analysis

Alternative A- No Action Alternative

Direct and Indirect Effects:
Scenic Integrity and Scenic Integrity Objectives - Only existing open motorized routes would remain on these landscapes, but they would have no impact to scenic character because there would be no change to the ground.

Cross-country, overland travel was previously prohibited by the Tri-State Decision in 2001 (formally known as the Off-Highway Vehicle Decision and Plan Amendment for Montana, North Dakota and Portions of South Dakota), amending the Forest Plans. The Forest Plan (RFP 2009) continues this prohibition; therefore, current management does not allow unauthorized construction of motorized routes, which would deteriorate existing scenic integrity.

Scenery would be the area within the viewsheds of Concern Level 1 and 2 routes and sites. In conjunction with the past, present and future actions or events described above, cumulative effects would occur only if new road or trail construction, or partial or full obliteration, were to occur within Concern Level 1 and 2 viewsheds. Neither action would occur under the No Action alternative.

Alternative B- Proposed Action

Direct and Indirect Effects:
Scenic Integrity and Scenic Integrity Objectives - This alternative would designate some motorized routes, change the VT/SOU, close some routes to motorized public use, convert some roads to trails, decommission some routes, and leave others the way they are. These are administrative changes, not visual or physical.

In general, route decommissioning would improve the long-term scenic character of these landscapes, even if only left to revegetate naturally over time. The designation of existing unauthorized routes to the National Forest Road or Trail System would have no impact to scenic integrity of the landscape character because any such route under the Proposed Action already exists on the ground. No new road or trail construction would occur under this alternative; therefore, no effect to scenery would result due to construction activities. Additionally, no routes are proposed for partial or full obliteration under this alternative; therefore no effect would result due to restoration activities.

The Forest Plan prohibits all motorized cross-country, overland travel within these landscapes. The Proposed Action also does not allow unauthorized construction of motorized routes, which would deteriorate existing scenic integrity.

As described in the Existing Condition, Concern Level 1 travel routes and use areas are those that are nationally or regionally important locations associated with recreation and tourism use, where there is a high interest in scenic resources, and Concern Level 2 refers to those that are locally important and are associated with recreation, and where there is a high to moderate interest in scenic resources. (USDA 1995). These are important as a platform for people to view scenery. Although the analysis is beyond the scope of this project, it is unlikely that the unauthorized routes proposed for designation to National Forest Service System Roads or Trails would become Concern Level 1 or 2 routes. However, several of these routes are described in the Recreation Resources Report as providing recreational value, such as loop opportunities, access to dispersed campsites, and scenic overlooks. No Concern Level 1 or 2 roads or trails are proposed for decommissioning or closure to public use under the Proposed Action.

The Proposed Action also proposes a no-wake restriction for Elk Lake. The no-wake proposal does not prohibit gasoline motors but restricts use to speeds that don't generate a white-water wake, about 10 MPH or less. No effect to scenery would result due to this proposal.

Cumulative Effects:
The cumulative effects area for scenery would be the area within the viewsheds of Concern Level 1 and 2 routes and sites. In conjunction with the past, present and future actions or events described above including the closure of 32.9 miles fo routes under Forest Plan ROD 2, cumulative effects

would occur only if new road or trail construction, or partial or full obliteration, were to occur within Concern Level 1 and 2 viewsheds. Neither action would occur under the Proposed Action alternative. While no restoration of routes is proposed under this project, future restoration activity, if deemed necessary through future decisions, may have a short-term effect to scenery due to ground disturbing activity. Over the long-term, restoration activities would improve the long-term scenic character of these landscapes.

Alternative C

Direct and Indirect Effects:
Scenic Integrity and Scenic Integrity Objectives - This alternative would close unauthorized routes to motorized public use. These are also administrative changes, not visual or physical.

In general, route closure or decommissioning would improve the long-term scenic character of these landscapes, even if only left to re-vegetate naturally over time. The continued designation of roads or trails as part of the National Forest Road or Trail System would have no impact to scenic integrity of the landscape character because any such route under this alternative already exists on the ground. No new road or trail construction would occur under this alternative; therefore, no effect to scenery would result due to construction activities. Additionally, no routes are proposed for partial or full obliteration under this alternative; therefore no effect would result due to restoration activities.

The Forest Plan (RFP 2009) prohibits all motorized cross-country, overland travel within these landscapes. This alternative also does not allow unauthorized construction of motorized routes, which would deteriorate existing scenic integrity.

As described in the Existing Condition, Concern Level 1 travel routes and use areas are those that are nationally or regionally important locations associated with recreation and tourism use, where there is a high interest in scenic resources, and Concern Level 2 refers to those that are locally important and are associated with recreation, and where there is a high to moderate interest in scenic resources. (USDA 1995). These are important as a platform for people to view scenery. Although the analysis is beyond the scope of this project, it is unlikely that the unauthorized routes proposed for designation to National Forest Service System Roads or Trails would become Concern Level 1 or 2 routes. No Concern Level 1 or 2 roads or trails are proposed for decommissioning or closure to public use under this alternative.

This alternative does not propose a no-wake restriction for Elk Lake. No effect to scenery would result regarding a no-wake zone or absence thereof.

Cumulative Effects:
The cumulative effects area for scenery would be the area within the viewsheds of Concern Level 1 and 2 routes and sites. In conjunction with the past, present and future actions or events described above including the closure of 32.9 miles fo routes under Forest Plan ROD 2, cumulative effects would occur only if new road or trail construction, or partial or full obliteration, were to occur within Concern Level 1 and 2 viewsheds. Neither action would occur under this alternative.

While no restoration of routes is proposed under this project, future restoration activity, if deemed necessary through future decisions, may have a short-term effect to scenery due to ground disturbing activity. Over the long-term, restoration activities would improve the long-term scenic character of these landscapes.

Alternative B Modified

Direct and Indirect Effects:
Scenic Integrity and Scenic Integrity Objectives - This alternative was developed based on comments from the public and the Forest Interdisciplinary Team (IDT) following the comment period. The effects of this alternative are the same as those described under the Proposed Action. See section "Alternative B – Proposed Action" above.

Cumulative Effects:
The effects of this alternative are the same as those described under the Proposed Action.

Summary of Effects:

Effects to scenery would only occur within the viewsheds of Concern Levels 1 and 2 routes and sites, only if new road or trail construction or partial or full obliteration were to occur. These activities are not proposed to occur under this range of alternatives.

Table 49 Scenery Comparison of Effects

Item of Comparison	Alternative A – No Action	Alternative – B Proposed Action	Alternative C	Alternative B Modified
Scenic Integrity	High degree of scenic integrity; intact.	High degree of scenic integrity; intact.	High degree of scenic integrity intact.	High degree of scenic integrity; intact.

References

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Bureau of the Census, U.S. Department of Commerce. County Business Patterns (CBP) http://www.census.gov/epcd/cbp/view/cbpview.html Tel 301-763-2580

Bureau of Economic Analysis, U.S. Department of Commerce. Regional Economic Information System (REIS). http://bea.gov/bea/regional/data.htm

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Glossary

All Terrain Vehicle (ATV) – Motor vehicle less than or equal to 50” in width with three or more low-pressure tires, handle-bar steering and a seat designed to be straddled by the operator

Decommissioned Roads – As identified in 36 CFR 212.1 a decommissioned road is an unneeded road that is stabilized, and restored to a more natural state. When a system road is decommissioned, the miles are removed from the total miles that make up the system.

Designated Road, Trail, or Area. –A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map. (36 CFR 212.1).

Forest Road or Trail – A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization or the National Forest System and the use and development of its resources. (36 CFR 212.1; 36 CFR 251.5; 36 CFR 261.2).

Forest Transportation Atlas – A display of the system of roads, trails and airfields of an administrative unit. (36 CFR 212.1).

Highway Vehicle – Any motor vehicle that is licensed or certified under State law for general operation on all public roads within the state.

Invasive plant/species – Those non-native plant species, which when established is or may become destructive and difficult to control by ordinary means of cultivation or other control practices.

Jurisdiction – The legal right or authority to control, operate, regulate use of, maintain, or cause to be maintained, a transportation facility, through ownership or delegated authority. The authority to construction or maintain such a facility may be derived from fee title, easement, written authorization, or permit from a Federal agency, or some similar method. (23 CFR 660.103).

Maintenance Level – Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria. (FSH 7709.58, 12.3). *See also operational maintenance level and objective maintenance level.*

- Maintenance Level 1. Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resource to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate". Roads receiving level 1 maintenance may be of any type, class or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses. (FSH 7709.58, 12.3).

- Maintenance Level 2. Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log hauling may occur at this level. Appropriate traffic management strategies are either to (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles. (FSH 7709.58, 12.3).

- Maintenance Level 3. Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users. (FSH 7709.58, 12.3).

- Maintenance Level 4. Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is "encourage." However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times. (FSH 7709.58, 12.3).

- Maintenance Level 5. Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is "encourage." (FSH 7709.58, 12.3).

Motor Vehicle – Any vehicle which is self-propelled, other than:

- A vehicle operated on rails; and any wheelchair or mobility device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area. (36 CFR 212.1; 36 CFR 261.2; FSM 2353.05). Excludes aircraft, watercraft, and over snow vehicles according to 36 CFR 212.51.

Motorcycle – Two wheeled vehicle on which the two wheels are in-line, not side-by-side.

Motorized Vehicle Trail – A motorized route open to motor vehicles as defined above.

Motor Vehicle Use Map – A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System. (36 CFR 212.1).

National Forest System Land – All lands, waters, or interests therein administered by the Forest Service. (36 CFR 251.51).

National Forest System Road – A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority. (36 CFR 212.1; 36 CFR 251.51; 36 CFR 261.2).

National Forest System Trail – A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority. (36 CFR 212.1; 36 CFR 261.2; FSM 2353.05).

Noxious weed – Those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.

Objective Maintenance Level – The maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns.

The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. (FSH 7709.58, 12.3).

Operational Maintenance Level – The maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained. (FSH 7709.58, 12.3).

Road Decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1). Road Maintenance. The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective. (FSM 7705).

Street Legal Vehicle – must be registered as a motor vehicle (have a license plate). Operators must have a valid driver's license (16 year age requirement) with a motorcycle endorsement; The OHV must have headlight with high and low beam, tail light and reflector, brake light, at least one operable brake (hand or foot), horn, rear-view mirror, muffler with no modifications, and spark arrestor; Children ages 12-16 who possess a Safety Certificate are allowed to operate a street legal OHV as long as they are accompanied by a licensed operator; Non-street legal vehicles in Montana can only operate on designated motorized trails or areas, provided they have an off-highway vehicle decal.

Temporary Road or Trail. – A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas. (36 CFR 212.1).

Unauthorized Road or Trail – A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas. (36 CFR 212.1).

Vehicle – Any device in, upon, or by which any person or property is or may be transported, including any frame, chassis, or body of any motor vehicle, except devices used exclusively upon stationary rails or tracks. (36 CFR 261.2).

Consultation and Coordination

IDT Members

Name	Title	Area Of Contribution
Laura Hudnell	IDT Leader	NEPA. writer, editor, project oversight
Jonathan Klein	Recreation	Recreation and trails
Craig Simonsen	Transportation Engineer	Roads and INFRA
Tim O'Neil	GIS	GIS and Maps
Keith Stockmann	Economic	Economics
Cynthia Manning	Social	Sociology
Art Rohrbacher	Forest Wildlife Biologist	Wildlife
Jim Brammer	Forest Fisheries Biologist	Aquatics
Kevin Weinner	Forest Hydrologist	Hydrology
Pam Fletcher	Soil Scientist	Soils
Kevin Suzuki	Madison District Range Specialist	Botany/Weeds/ Threatened And Sensitive Plants
Mark Sant	Archeologist	Heritage and Tribal Consultation
Noelle Meier	Forest Recreation Program Manager	Recreation, Travel Management, Visuals, and Project oversight.
Sue Heald	District Ranger, Madison Ranger District	Project oversight.
Alex Dunn	Forest Environmental Coordinator	Project oversight.
Peri Suenram	Forest Planning Staff Officer	Project oversight.
Patty Bates	Forest Recreation, Heritage and Engineering Staff Officer	Project oversight.

Federal, State, Local Governments

Bureau of Land Management, Dillon Resource Area, Dillon, MT;
Targhee National Forest, Ashton Ranger District, Ashton, ID;
Gallatin National Forest, Supervisor's Office, Bozeman, MT;
Montana Fish, Wildlife & Parks, Reg. 3 Headquarters, Bozeman, MT

Tribal Governments

Shoshone-Bannock Tribes
Confederated Salish and Kootenai Tribes

APPENDICES

Introduction

Map Packet Sent out With Comment EA:

Appendix A – (in Map Packet) is applicable for Alternatives A, B, B Modified, and C.

Appendix B – (in Map Packet) is applicable for Alternatives A, B, and C.

Appendices in the Updated EA:

Appendix C – Route-by-Route Changes and Rationale.
Appendix D – Updated Vehicle Type/Season of Use Map Code Key for Alternative B Modified.
Appendix E – Past, Present, and Reasonably Foreseeable Future Actions list.
Appendix F – Forest Plan Consistency Check List.
Appendix G – Response to Comments.